

No. 649,001.

Patented May 8, 1900.

W. SCOTT.

BED MOTION FOR CYLINDER PRINTING PRESSES.

(Application filed June 15, 1897.)

(No Model.)

3 Sheets—Sheet 1.

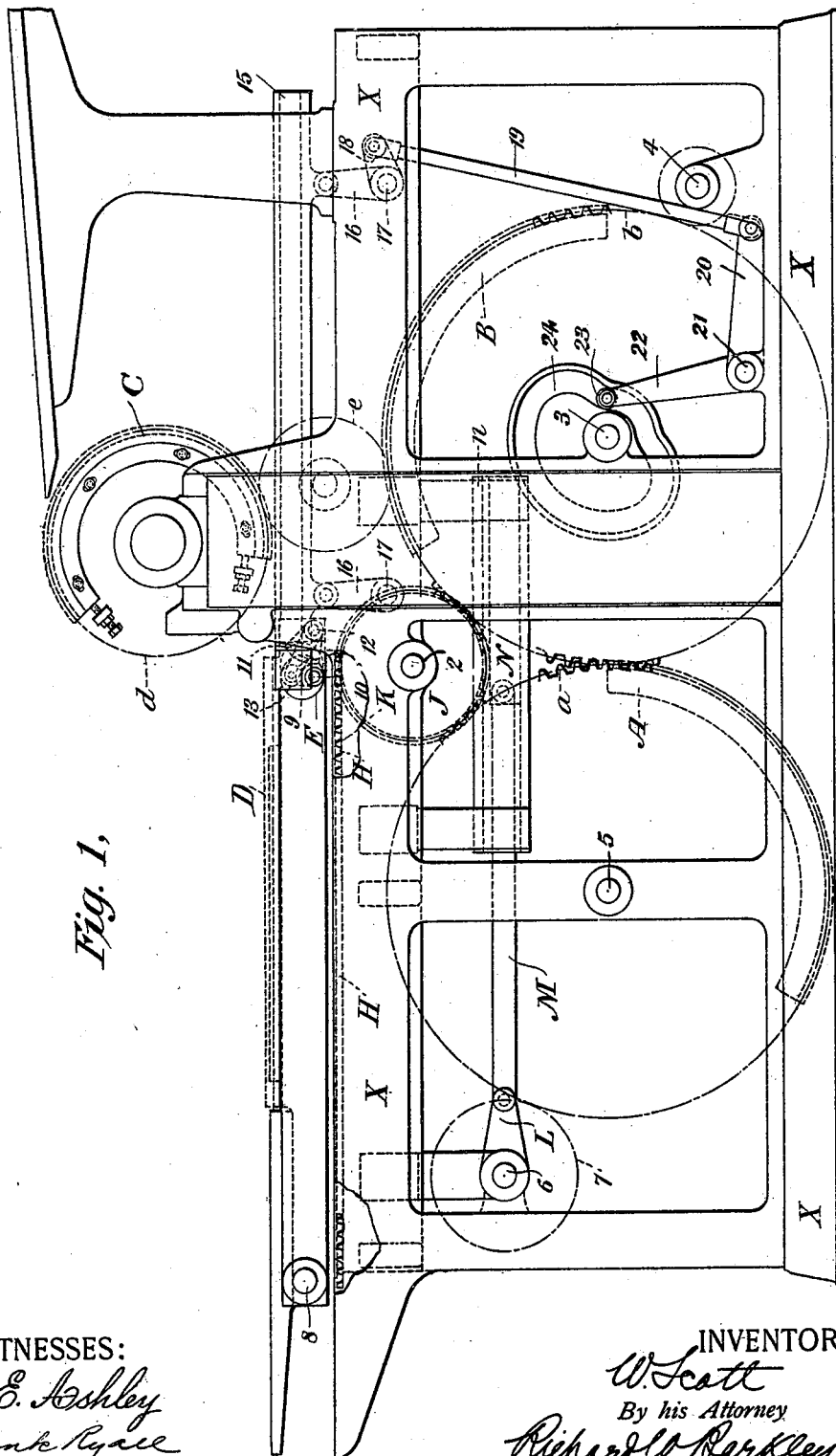


Fig. 1.

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*Frank Ryall*

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Fig. 2,

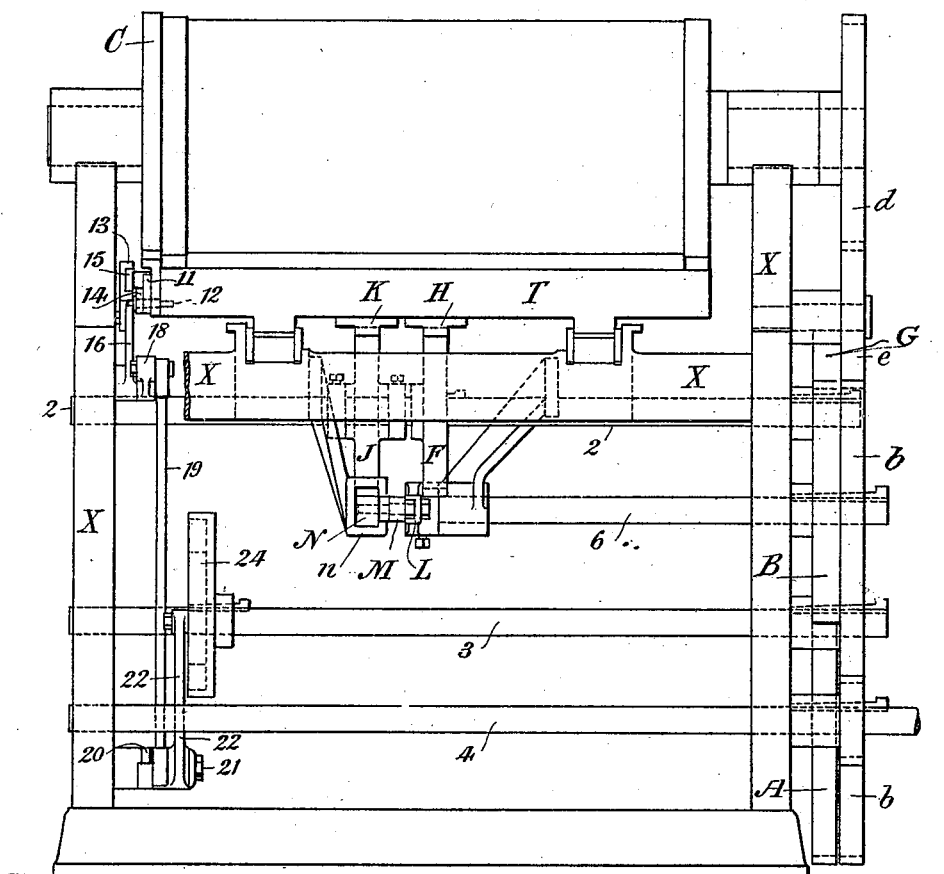
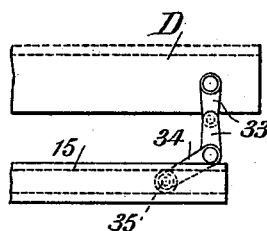


Fig. 5,



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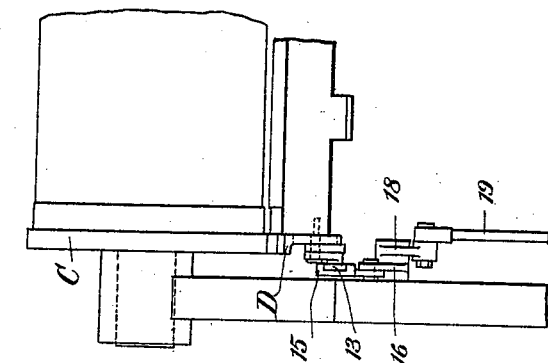


Fig. 4,

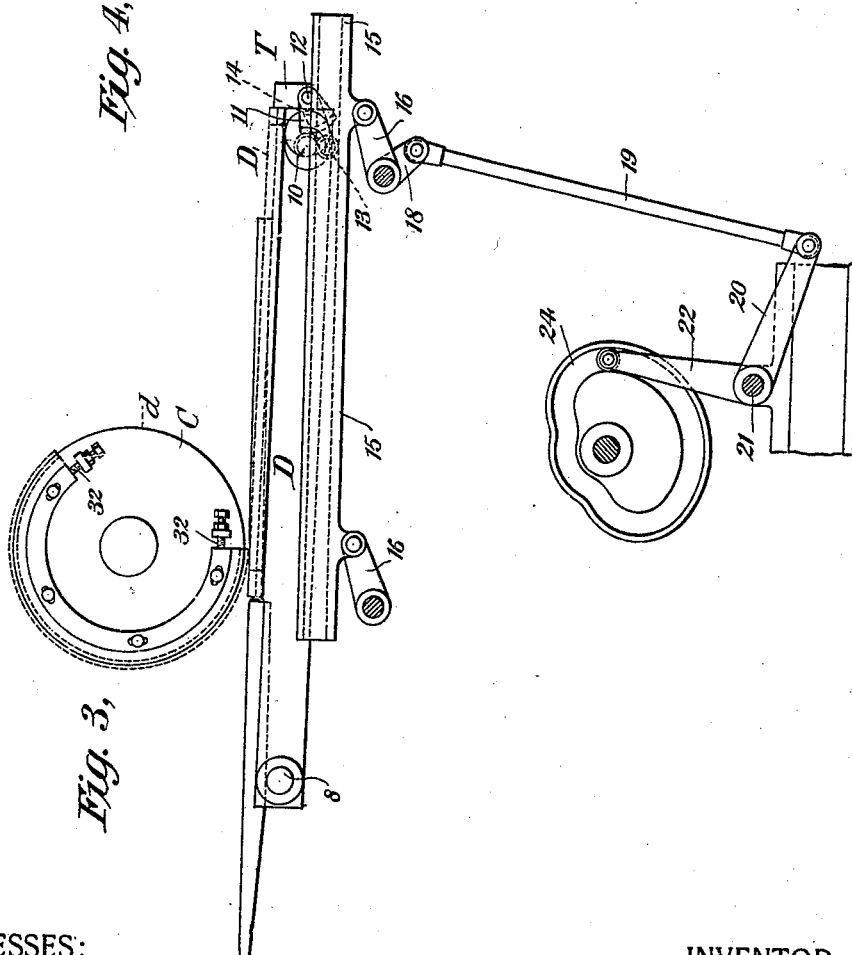


Fig. 3,

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# UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

## BED-MOTION FOR CYLINDER PRINTING-PRESSES.

SPECIFICATION forming part of Letters Patent No. 649,001, dated May 8, 1900.

Application filed June 15, 1897. Serial No. 640,818. (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 Bed-Motions for Cylinder Printing-Presses, of which the following is a specification.

This invention relates to that class of machines commonly called "bed-and-cylinder printing-presses," though certain features thereof are equally applicable to other classes of machines in which a reciprocating bed or member is used, as planers and the like. In one class of bed-and-cylinder presses the cylinder is rotated continuously while the bed moves to and fro, in another class the cylinder oscillates while the bed moves to and fro, and in a third class the cylinder is stationary during one stroke of the bed and is rotated during the other stroke thereof.

Certain features of my invention are applicable and useful in all three classes of printing-presses named above.

An object of my invention is to cause a uniform motion of the bed during the greater extent of its motion, with a quick, powerful, and smooth stopping, reversing, and starting of its motion at the ends of its strokes.

Another object is to cause accurate register of the bed and cylinder at the beginning of impressions and their equal motions during the taking of impressions.

Other objects will appear hereinafter.

To these ends the invention includes combinations of devices hereinafter described, and more particularly pointed out in the claims concluding this specification.

The preferred form of the invention is illustrated in the accompanying drawings, forming part hereof, in which—

Figure 1 is a partial side elevation of a printing-press, showing an embodiment of the invention. Fig. 2 is an end elevation from the right of Fig. 1. Fig. 3 is a side elevation of certain parts, showing them in a different position from that shown in Fig. 1. Fig. 4 is a partial end elevation of the parts shown in Fig. 3, and Fig. 5 is a side view of a modification of certain parts.

The impression-cylinder shown is driven continuously in one direction by the pinions

*deb*, the last of which meshes with the driver. The bed T is guided in any suitable or usual manner on the framework X of the machine and is provided with a rack H, fixed thereto on the under side at or near its central line. The bed is also provided with two short racks parallel to rack H and also on the under side of the bed, the two said short racks K being in line with each other. During the greater extent of its motion in both directions the bed T is driven by means of the rack H and is stopped, reversed, and started up by means of the racks K. In order to cause the bed to move uniformly while it is being driven by the rack H, I provide a pinion F, which is in mesh with the rack H while the bed is being driven thereby. This pinion F is fast on a shaft 2, which is journaled in the framework X transversely of the machine and is driven by the toothed segments A and B alternately. These segments A B are carried, respectively, by the pinions *a b*, which mesh with each other and are driven by the driver, above referred to. The segments A B in the case illustrated in the drawings are equal to each other and each occupies one-third of the circumference of the pinions on which it is placed. It will be noted that the pinions *a b* are in one plane and that the segments A B are in one plane at the side of the pinions *a b*. The shaft 2 is provided with a pinion G, fast thereto, which pinion is in the plane of the segments A B in position to mesh with them. The segments A B are so placed on the pinions *a b* that when either end of either segment is at the point of tangency of the pitch lines or circles of the pinions *a b* the nearest end on the other segment is sixty degrees away. From this arrangement it follows that the pinions *a b* rotate through one-sixth of a circumference from the time that one segment rolls out of mesh with the pinion G until the other segment rolls into mesh therewith. It is during this interval that the motion of the bed is stopped, reversed, and begun again. The segments A B give opposite directions of motion to the pinion G.

The motion of reversal of the bed is caused by the racks K and the pinion J, the latter being driven by suitable mechanism. The pinion J is on the shaft 2, but is loose thereon, so that it may rotate freely in either di-

rection. It is held against motion longitudinally of the shaft as by collars on the shaft. The pinion J is rotated by means of the reciprocating rack N, running in a guideway *n*, which is supported on brackets bolted to the frame X, the rack N and pinion J preferably being always in mesh with each other. The rack N is moved to and fro in the direction of the motion of the bed T by means of the crank L and the connecting-rod M, the crank being fast on a shaft 6, which is driven from the pinion *a* by means of the pinion 7 on said shaft 6, the two pinions being in mesh with each other. The pinion 7 shown is one-third the size of the pinions *a b*.

The parts thus far described operate as follows: With the parts in the positions shown in the drawings the bed T is at one extreme of its motion, the pinion J is in mesh with the corresponding rack K, and the parts J T K M N are at a standstill. The upward motion of the crank L moves the rack N to the left in Fig. 1, and the pinion J starts the bed T to the right in Fig. 1 with an accelerating motion. As the crank L reaches the point where it imparts the greatest speed to the bed T the segment B rolls into mesh with the pinion G (which of course is rotated by the rack H at this time) and the pinion J rolls out of mesh with the short rack K, and the bed is moved solely by the segment B. As the bed T approaches the end of its motion toward the right in Fig. 1 the segment B rolls out of mesh with the pinion G, and as it does so the pinion J (which has been rotating idly) rolls into mesh with the other of the short racks K. At this moment the crank L is near its uppermost position, and by the time it has reached its horizontal position the bed has been brought to a stop gradually and is started up gradually as the crank moves downwardly from the horizontal until such moment as the segment A rolls into mesh with the pinion G, when the pinion J rolls out of mesh with the rack K. (Shown at the left-hand side of Fig. 1.) The pinion J shown is equal to the pinion F and both are one-third the size of the pinions *a b*. The described construction gives a smooth and uniform motion to the bed between certain points, together with a quick, powerful, and smooth stop and start.

The invention also includes means for securing an accurate register of the bed and impression-cylinder in order to prevent any ill effects of wear or play in the gearing by which the said parts are driven. The impression-cylinder is provided with a toothed segment C at one end thereof, which extends about two-thirds of the way around the cylinder, being fast thereto. This segment C may be adjustable circumferentially of the cylinder, as by means of the curved slots 30, the set-screws or bolts 31, and the adjusting-screws 32. The bolts 31 pass through the slots 30 and engage with threaded holes in the end of the cylinder, while the screws 32 engage with threaded

perforations in lugs or ears on the end of the cylinder and bear against the ends of the segment C. The bed is provided with a movable register-rack D, which is shown as being pivoted to the bed near the ink-table end thereof, (see reference-numeral 8.) I provide suitable means for raising and lowering the free end of the rack D. Thus I show (see Figs. 1 and 2) an eccentric E, which is pivoted to the bed T and which bears against the rack D underneath the same, and mechanism for raising and lowering, or rather for rocking, the eccentric and so raising and lowering the rack D. This motion of the rack D is requisite in the case shown, inasmuch as the cylinder rotates continuously in one direction and the segment C has to pass the rack D while the bed is on its return or non-printing stroke. This occurs while the bed is passing from the position shown in Fig. 3 to the position shown in Fig. 1. The eccentric may be rocked by any suitable means, such as the toothed segment 9, which is fast to the eccentric E and moves with it about the stud or axis 10 on the bed T, the toothed segment 11, which is in mesh with the segment 9 and is itself pivoted to the bed at 12, the arm 14, which is fast to the segment 11 and is provided with an antifriction-roller 13, and the up-and-down-movable guide (channel-bar) 15. The guide 15 is carried by the equal arms 16, which are pivoted to the frame X, as at 17. One of the arms 16 is rigidly connected with an arm 18, which in turn is pivoted to a link or rod 19. The link 19 is pivoted at its other end to the pivoted arm or lever 20. The arms or levers 20 22 are fast together and are pivoted at 21 to a stud on the frame X. The arm 22 is provided with an antifriction-roller 23, which is controlled by the groove-cam 24, fast on the shaft 3, to which the pinion *b* is fast. The cam 24 is shaped in such wise that through the described connections the rack D is kept in proper mesh with the segment C during the forward or printing stroke of the bed T and is kept out of that path during the return or non-printing stroke of the bed. By means of the rack D and the segment C any wear or play of the mechanism for driving the bed and cylinder is prevented from affecting the impressions injuriously.

In Fig. 5 I show a modified means for raising and lowering the rack-bar D, consisting of the toggle mechanism 33, which is pivoted to the rack and to the bed and is operated by the bar 15 shown, there being an arm 34 on one element of the toggle provided with an antifriction-roller 35, which engages and is moved by the channel-bar 15. Other well-known mechanisms may be employed for raising and lowering the rack-bar D. It is obvious that an eccentric stud may be employed at the fixed or pivoted end of the rack for adjusting the rack endwise to mesh accurately with the segment C and also that the stud on which the rack D is pivoted may itself be adjustable for the same purpose.

The impression-cylinder may be raised and lowered by any usual or suitable means—as indicated in the drawings, by the guides, &c., on the frame X. I note that the impression-cylinder makes two revolutions for each turn of the pinion *b*.

I remark that many changes in details, parts of combinations, and arrangements may be made without departing from the spirit of my invention. Accordingly I am not to be understood as limiting myself to the precise form and arrangement thereof shown in the drawings and hereinbefore described.

What I claim is—

1. The combination of a reciprocating member or bed, a rack fixed thereon, a driver-gear in mesh with said rack, a pinion connected to said gear for driving the same, two oppositely-moving toothed segments for driving said pinion alternately in opposite directions, and means for completing, stopping, and reversing the motion of the bed at the ends of the strokes thereof, substantially as described.

2. The combination of a reciprocating member or bed, a rack H fixed thereon, a driving-gear F in mesh with said rack, a pinion G connected to said gear F, the gear-segments A, B, for alternately meshing with said pinion G to drive it in opposite directions, the intermeshing pinions *a, b*, on which said segments A, B, are fast, and means for completing, stopping, and reversing the motion of the bed at the ends of its strokes, substantially as described.

3. The combination of the reciprocating member or bed, the rack H connected thereto, the pinion F meshing with said rack, the pinion G connected with said pinion F, the toothed segments A B for driving the pinion G alternately in opposite directions, the pinions *a b* carrying said segments A B, the two short racks K on the bed, the pinion J for coaction with said racks K to complete stop and reverse the motion of the bed at the ends of its strokes, a guided to-and-fro-moving rack connected with the pinion J, and a crank-motion for operating the last-named rack, substantially as described.

4. In a printing-press, the combination of the impression-cylinder, a register gear or segment connected with the cylinder, a reciprocating type-bed, a rack on said bed movable vertically into and out of position for coaction with said gear or segment, a vertically-movable controller on the framework of the machine for controlling the said movable rack at all times, and means for operating said controller, substantially as described.

5. In a printing-press, the combination of the impression-cylinder, a register gear or segment connected to the cylinder, a reciprocating type-bed, a rack-bar pivoted to the said bed and movable vertically into and out of position for coaction with said segment or gear, a vertically-movable controller on the framework connected to and continuously

controlling the pivoted rack, and means for operating said controller, substantially as described.

6. In a printing-press, the combination of the impression-cylinder, a register gear or segment connected to said cylinder, a reciprocating type-bed, a rack-bar pivoted at one end to said bed and movable up and down into and out of position for coaction with said register gear or segment, a movable controller on the framework connected to and continuously controlling the said rack, and means for operating said controller, substantially as described.

7. In a printing-press, the combination of the impression-cylinder, a register gear or segment connected with said cylinder, a reciprocating bed, a rack movable up and down on said bed into and out of position for coaction with said register gear or segment, a slot-bar movable vertically on the framework of the press, and connections between said slot-bar and said rack for controlling the latter continuously and operating the same, substantially as described.

8. In a printing-press, the combination of the impression-cylinder, a register gear or segment connected to said cylinder, a reciprocating type-bed, a rack-bar pivoted at one end to said bed on a horizontal axis and movable into and out of position for coaction with said register gear or segment, and a movable slot-bar on the framework and connected to and continuously controlling the said rack-bar, substantially as described.

9. In a printing-press, the combination of the impression-cylinder, a register gear or segment connected to said cylinder, a reciprocating type-bed, a rack pivoted at one end on a horizontal axis to said bed, an up-and-down-movable slot-bar on the framework of the press, a lever provided with an antifriction-roller which works in said slot, and connections between said lever and said rack-bar, said lever being fulcrumed on the bed, substantially as described.

10. The combination of a reciprocating bed or member, a rack H connected thereto, a gear F for driving said rack H, the pinion G for driving with gear F, the intermeshing pinions *a b*, the segments A B borne by said pinions *a b* and extending one-third of the way around them said segments being sixty degrees (60°) apart as described, said mechanism driving the said bed during the greater extent of its motion in both directions, and mechanism for completing, stopping, and reversing the motion of the bed, substantially as described.

Signed at New York, in the county of New York and State of New York, this 3d day of May, A. D. 1897.

WALTER SCOTT.

Witnesses:

R. W. BARKLEY,  
CHAS. A. BRODEK.