

2 Sheets—Sheet 1.

## BED MOTION FOR CYLINDER PRINTING MACHINES.

Patented July 7, 1896.



C. E. Ashley  
14 W. Lloyd.

Inventor  
W. Scott,

Wilcox, Barkley & Broderick.

(No Model.)

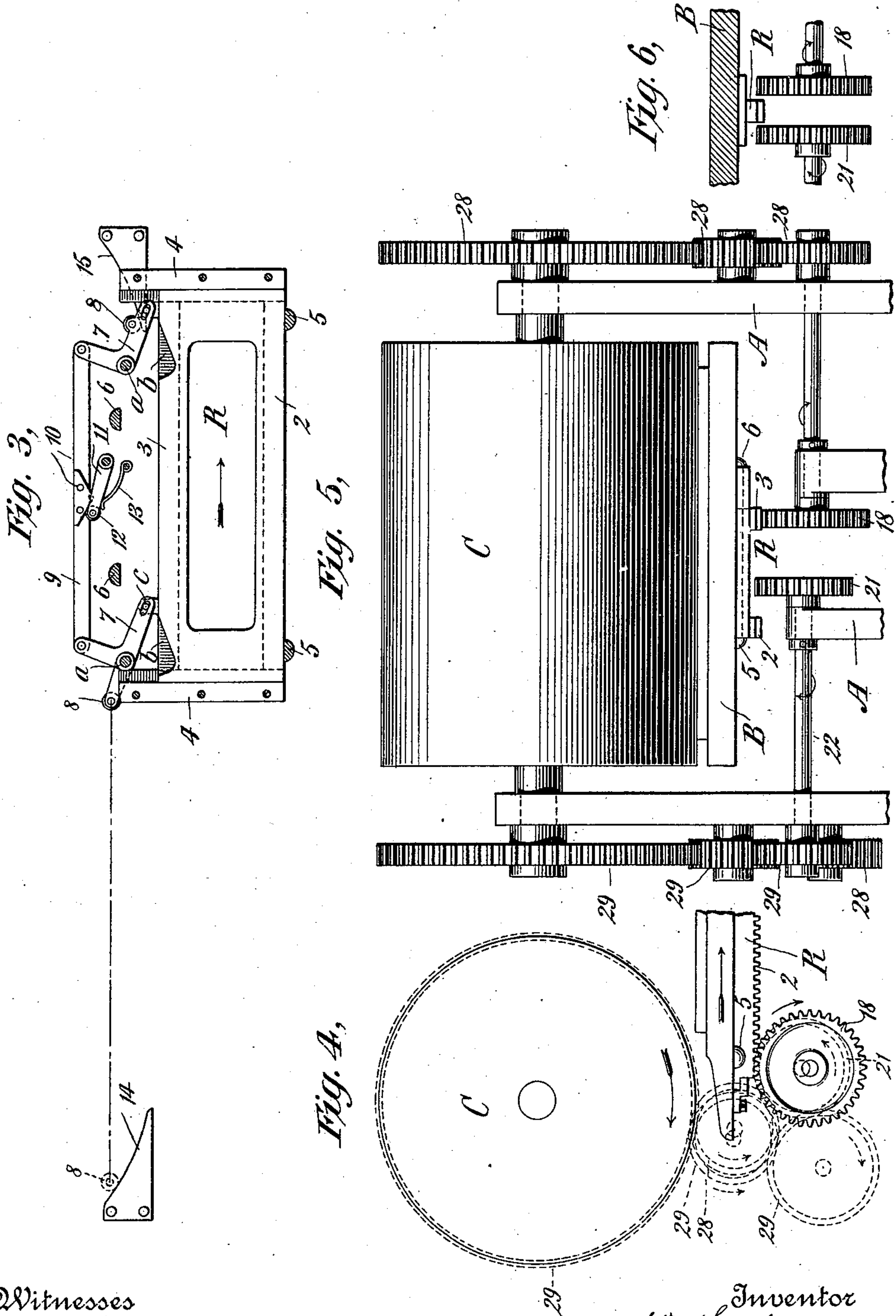
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W. SCOTT.

BED MOTION FOR CYLINDER PRINTING MACHINES.

No. 563,511.

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Witnesses  
C. E. Ashley  
J. W. Lloyd.

Inventor  
W. Scott,  
By his Attorneys  
Wilcox, Parker & Proctor



# UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

## BED-MOTION FOR CYLINDER PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 563,511, dated July 7, 1896.

Application filed April 12, 1894. Serial No. 507,304. (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-Machines, of which the following is a specification.

This invention relates, primarily, to means for giving a reciprocating motion to the beds of cylinder printing-machines, but it is equally applicable in other classes of machinery wherein there is employed a reciprocating member, as planers, &c. There are several classes of such printing-machines, the invention being applicable to all of them. One of these classes includes cylinders which revolve continuously, being lifted during the return or non-printing stroke of the bed, or having a depressed part which is opposite the bed during such stroke. A second class of these machines includes a cylinder which is at rest during the return stroke of the bed, but which moves in unison with the bed during the forward or printing stroke thereof, and which is either lifted during such return stroke or has a flat or depressed portion to come opposite the same during the return stroke. In another class there is an oscillating impression-cylinder, commonly driven by a rack on the bed, which takes impressions in several ways, as during one stroke only of the bed, being lifted during the other stroke, or it may take impressions during both strokes. There is another class of such machines wherein a number of impression-cylinders coact with one bed in a variety of ways, but as these are well known to makers and users of this class of machines, it is not necessary to here specify them. The aim of the maker in all these cases is to obtain and maintain an exact equality of speed of the printing and impression surfaces during the printing, and a quick reversal of the motion of the bed, with smoothness of motion of all parts. Such is the end of this invention.

In the practice of this invention there is a rack member on the reciprocating bed and movable relatively thereto, which rack coacts with two driver-gears, one at a time, to move the bed throughout the greater extent of its motion in each direction, and suitable means

for completing, stopping, and reversing the motion of the bed when it passes from the control of the driver-gears.

The invention also includes other combinations of devices, as will hereinafter fully appear.

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

Figure 1 is a sectional side view in the direction of the arrows, taken on the line 1 1 of Fig. 2, showing the reciprocating bed, a rack thereon movable relatively thereto, a mutilated rack on said bed, a rolling gear for coaction with the mutilated rack to complete, stop, and reverse the motion of said bed, driver-gears for coaction with the movable rack to drive the bed throughout the greater extent of its motion in each direction, and gearing connecting said drivers and other parts. Fig. 2 is a sectional end view in the direction of the arrows, taken on the line 2 2 of Fig. 1, showing said parts, also a cam for actuating said movable rack. Fig. 3 is a diagrammatic plan view showing the movable rack, means for actuating it to move relatively to the bed, and detent devices for holding it in its two positions. Fig. 4 is a view similar to Fig. 1, showing another arrangement of the connecting gearing between the driver-gears. Fig. 5 is an end view showing the last-named mechanism. Fig. 6 is an end view of a modification, showing driver-gears and a one-member rack which coacts with said gears.

In the drawings, the reference-letter A marks a suitable framework to support the moving parts.

The reference-letter C marks an impression-cylinder which is journaled in the framework.

The reference-letter B marks the reciprocating bed or member which is supported upon and guided by the framework in any suitable manner, (not shown,) and the reference R marks a rack mounted upon said bed and slidable thereon to bring it into position for coaction with first one and then the other of the driver-gears. In Figs. 1, 2, 3, 4, and 5 the rack is double, being composed of two like members 2 and 3, which coact each with its own driver-gear. The rack R is shown as sliding transversely of the bed B on the sup-



ports 4, which are bolted to the bed. Suitable stops 5 and 6 on the bed limit the motion of the rack in both directions. The means shown for giving motion to the rack consists of levers 7, which are pivoted at *a* to the bed and which are connected with the rack by means of a slot-and-pin connection *c*, each lever 7 having an antifriction-roller 8 thereon or connected therewith for coaction with the cams 14 and 15 on the framework, the levers 7 being joined together by means of a bar 9 pivotally connected to them. On said bar 9 is a double incline or wedge 10, with which the roller 12 on the lever 11, pivoted upon the bed, coacts to hold the bar, levers, and rack in the two extremes of their motion, a spring 13 pressing the roller 12 against the faces of the wedge 10. The back of the rack R is cut away, as at *b*, to receive the levers 7 when the rack is in one position. There is also shown a rack-bar 16, which is fast upon the bed and has a mutilated portion 17. In the position of the parts shown in Figs. 1 to 5, inclusive, the member 3 of the rack is in engagement or mesh with its driver-gear 18, which is on the shaft 19, journaled in the framework. In Figs. 1 and 2 the driver-gear 18 is connected by a train of gearing 20 with the driver-gear 21, which is upon the shaft 22. The arrows in the various figures indicate the directions of motion of the parts when connected as shown. Since the rack R is moved from one to the other of the driver-gears once for each stroke of the bed, it is necessary to control, or complete, stop, and reverse the motion thereof and move it until the rack R is again in mesh with one of the drivers. There are a number of ways in which this last function may be obtained, among which may be named those shown in patent to Miehle, dated July 14, 1885, and numbered 322,309, and the patent to Whitlock, dated July 19, 1892, and numbered 479,382. The mechanism shown in the accompanying drawings for obtaining this function consists of the mutilated rack 16, hereinbefore named, the rack 23 on the standard D, and the rolling-gear 24, which meshes with the rack 23 and is journaled upon a stud on the sliding bar 25, which is guided in the said standard D. The said bar 25 has a transverse slot 26, which engages with the wrist-pin 27, fast upon the driver-gear 18.

The operation of the parts so far described is as follows: Power is applied by means of a drum and belt or otherwise to the shaft 19 or other part of the mechanism. With the parts in the positions shown in Figs. 1, 3, and 5, the bed is being driven by the gear 18, which is about to roll out of mesh with the rack member 3, while the rolling gear 24 has just rolled into mesh with the rack 16. The cam 15 is about to move the rack over against the stops 6. During the rotation of the gear 18 from the position shown in Fig. 1 the wrist 27 moves to the right and downward, thus

causing the rolling gear 24 to move the bed B to the right to stop it, and to reverse the motion thereof and move it to the left until such time that its speed is equal to that of the gear 21, when the last-named gear rolls into mesh with the rack member 2, after which the gear 24 comes opposite the mutilated portion 17 of the rack 16. As the bed approaches the limit of its motion to the left in Fig. 1, the rolling gear 24 comes into mesh with the second member of the rack 16 at a time when the wrist-pin 27 is approaching its lowest position and the gear 21 is about to roll out of mesh with the rack member 2. The rolling gear 24 completes, stops, and reverses the motion of the bed in a manner before described, while the cam 14 moves the rack R against stops 5, as shown in Fig. 3. It is during the motion of the bed from right to left in Fig. 1 that the continuously-revolving cylinder C takes an impression from the form on the bed B, the cylinder being driven from the shaft 19 by a train of gearing 28.

In Figs. 4 and 5 the train of gearing 20 is omitted and the shaft 22 of the driver-gear 21 is connected with the shaft of cylinder C by a train of gearing 29. The arrows indicate the direction of motion of the gears. With the gearing shown in Figs. 1, 2, 3, and 4, the speed of the bed in both directions is the same.

In Fig. 6 the rack R comprises but a single member, which is moved into mesh with both the driver-gears. It will be noted that the horizontal plane including pitch-line of the rack R is tangent to the pitch-circles of the driver-gears.

Many changes in details, particularly in the mechanism for completing, stopping, and reversing the motion of the bed, may be made without departing from the spirit of this invention.

Of course, by suitably arranging the gearing, the driver-gears 18 and 21 can be given different speeds, so that the motion of the bed will be faster in one direction than in the other. Again, the members of the rack R may be independent of each other and each have its independent operating mechanism, so that the motion of either member to bring it into mesh with its driver would be less than in the case shown in the drawings.

What I claim is—

1. The combination of a reciprocatory bed or member, a rack thereon movable relatively thereto into two positions, cams and levers to so move the rack, a bar connecting the levers, a tooth on said bar, a detent device coacting with said tooth to hold said bar in either of its positions, means for actuating said rack and bed throughout the greater part of their motion, and means to complete, stop and reverse said motion, substantially as described.

2. The combination of the reciprocating bed, a rack R thereon and movable relatively



thereto, levers 7 connected to said rack, bar  
9 connecting said levers, the V-tooth 10 on  
said bar, the lever 11, wheel 12, spring 13,  
means for operating said levers 7, and mech-  
5 anism for driving said bed to and fro, sub-  
stantially as described.

Signed at New York, in the county of New

York and State of New York, this 22d day of  
March, A. D. 1894.

WALTER SCOTT.

Witnesses:

RICHARD W. BARKLEY,  
CHARLES A. BRODEK.