

(No Model.)

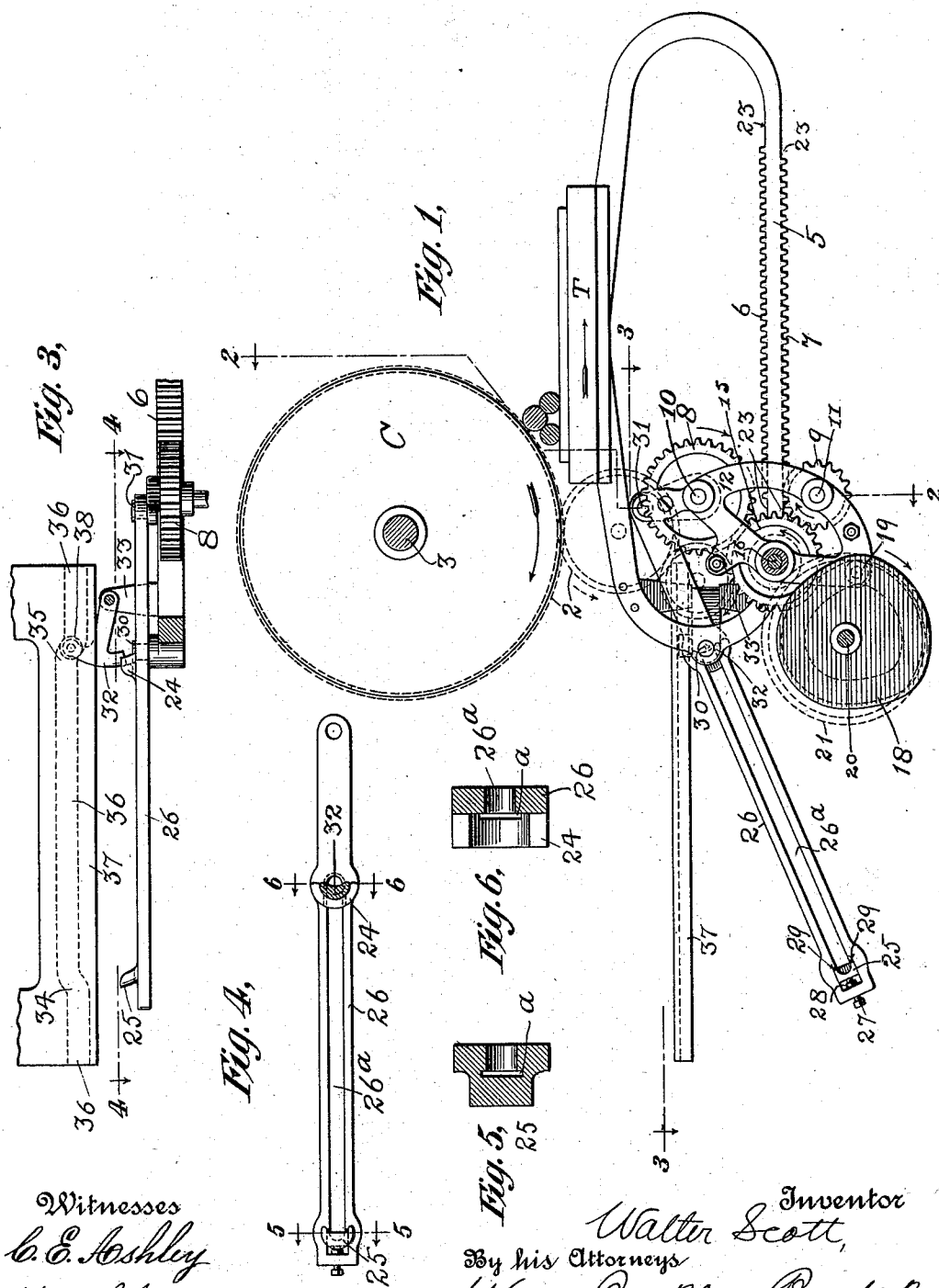
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W. SCOTT.

BED MOTION FOR CYLINDER PRINTING MACHINES.

No. 562,427.

Patented June 23, 1896.



Witnesses
C. E. Ashley
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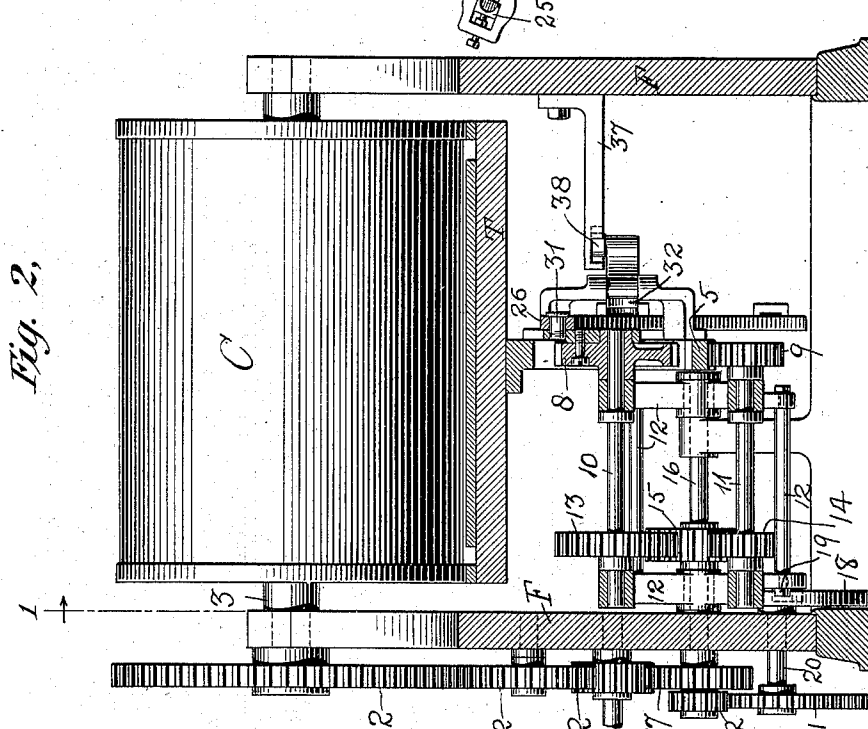
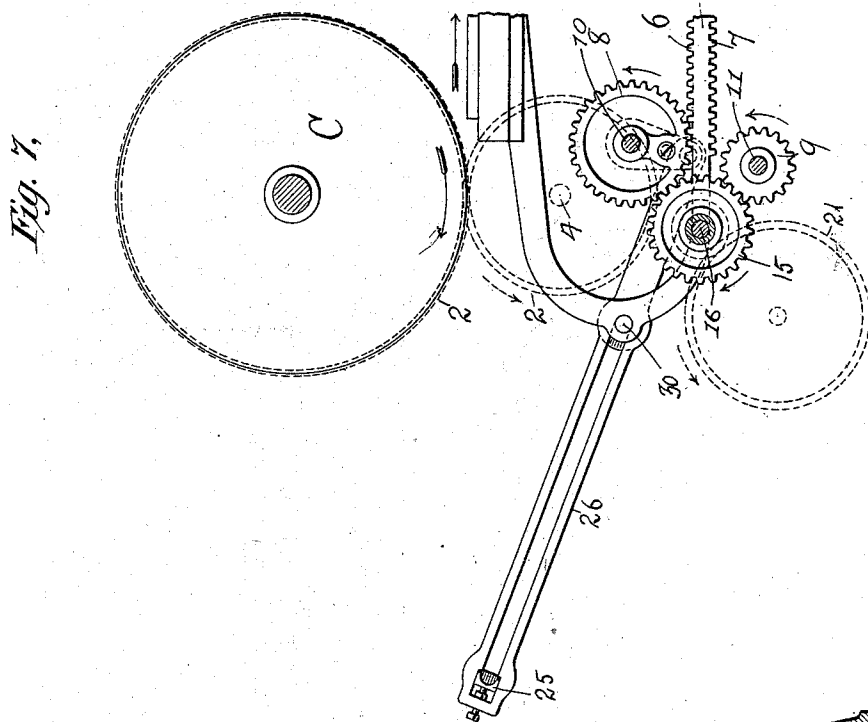
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UNITED STATES PATENT OFFICE.

WALTER SCOTT, OF PLAINFIELD, NEW JERSEY.

BED-MOTION FOR CYLINDER PRINTING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 562,427, dated June 23, 1896.

Application filed February 27, 1894. Serial No. 501,696. (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 the means for giving a reciprocating motion to the beds of cylinder printing-machines. There are several classes of such machines, and the invention is applicable to them. One such class includes continuously-revolving cylinders which are lifted during the return or non-printing stroke of the beds, or which have a depressed part which is opposite the bed during such return stroke. Another class of these machines includes a cylinder which is at rest during the return stroke of the bed and which is driven in unison with the bed during the forward or printing stroke thereof, there being a flat or depressed portion on the cylinder which is opposite the bed during such return. In another class the cylinder is an oscillating one, being driven usually by a rack on the bed. Such cylinder may take impressions in a variety of ways, as during one stroke of the bed and not during the other, being raised from the impressing position during the return stroke, or it may take impressions during both strokes. Again, there is a class wherein there are two or more impression-cylinders for one bed, which coact therewith in ways well known to makers and users of machines of this class. In all these classes the aim is to secure an exact equality of speed of the printing and the impression surfaces, coupled with a quick reversal of the motion of the bed and smoothness of motion of all parts. The object of this invention is to secure all these ends.

This invention consists in the combination, with such reciprocating bed, of an alternating or to-and-fro moving controller or arm guided on or by the bed, so that the bed is quickly but gradually brought to rest and is then gradually and quickly started in the opposite direction by a positive action. It also includes the combination, with the rack of such a bed, of a driver-gear on a fixed axis, a movable carrier or frame, and gearing mesh-

ing with said driver-gear, which gearing is mounted on the carrier and is moved thereby into and out of mesh with said rack, and means for completing, stopping, and reversing the motion of said bed. It further consists in the combination, with such bed, of a driving-pinion actuating the same through a rack thereon and an oscillating controller or arm guided on or by the bed for the like purpose, and other combinations of parts hereinafter more particularly pointed out.

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

Figure 1 is a side cross-sectional elevation of the bed and its actuating mechanism, taken on the plane indicated by the line 1 1 of Fig. 2. Fig. 2 is a cross-sectional end elevation of the bed and the said mechanism, taken on the plane indicated by line 2 2 in Fig. 1. Fig. 3 is a plan view of the alternating bar, the controllers or arms, and the latch for connecting the latter with the bed. Fig. 4 is a view of said bar, arms, and latch, taken on the plane indicated in Fig. 3 by the line 4 4. Fig. 5 is a view of said bar and arm *a* on the plane indicated by line 5 5 in Fig. 4. Fig. 6 is a view of said bar and arm *b* on the plane indicated by line 6 6 in Fig. 4, and Fig. 7 is a cross-sectional side view of a modification of the driving mechanism shown in Fig. 1.

The invention is shown in connection with a printing-press of that class (mentioned above) wherein the cylinder continuously revolves in one direction, being raised from its impression-taking position during the return stroke of the bed.

In the particular machine shown, the impression-cylinder *C* practically has a constant speed, makes one revolution to each stroke of the bed *T*, and is driven by a train of gearing 2, one of which gears is fixed to its shaft 3, from the main shaft 4, which is driven in any suitable way, as by a belt and pulley. (Not shown.) The type-bed *T* has a rack-bar 5 fixed thereto, which is composed of two members 6 and 7, which are shown as being back to back on the bar 5, but which may be placed facing each other, or otherwise. For the purpose of driving this rack I employ suitable gearing, a part of which is mounted in a frame arranged to have a reciprocating motion to

cause the same to engage the two members of the rack alternately.

In the particular form of gearing shown, the upper member 6 of the rack coacts, during the printing-stroke of the bed, with the gear 8, and the lower member 7 of the rack coacts, during the return stroke, with the gear 9. These gears 8 and 9 are respectively fixed on shafts 10 and 11, which are journaled in the movable framework 12. The gears 13 and 14, which are respectively fixed on the shafts 10 11, mesh with a gear 15, which is fixed on a shaft 16. There is a gear 17 fixed on shaft 16, which meshes with and is driven by the gear 2 on shaft 4. The movable framework 12 is pivoted on the shaft 16 and is periodically moved by means of the cam 18, which engages a pin or roller 19 on the said framework. The cam 18 is fixed on the shaft 20, which is journaled in the main framework F, and which is driven by the train of gears 21 22 from shaft 16. The gears 8 9 are so placed in the framing 12 that both are disengaged from the rack in certain positions of the parts, and the rack itself is not as long as the stroke of the bed, being omitted for a distance at each end of the bar 5, see reference 23.

For the purpose of completing, stopping, and reversing the motion of the bed after the driving-pinion 8 or 9 is out of mesh with the rack-bar I make use of an alternating, or to-and-fro-moving, controller or arm which is guided on or by the bed, (including thereby all that which is rigid with the part upon which the forms are placed,) and which is periodically engaged with the bed for this purpose. This controller or arm is connected with and operated by some suitable part of the bed-driving mechanism. For purposes of construction and simplicity of parts it is preferable to have two such controllers or arms, and to unite them rigidly in what is practically one piece.

In that form of the invention shown in the drawings the controllers 24 and 25 are fixed on or integral with the slotted bar 26. By preference the distance between these controllers is made adjustable, as by means of the screw-bolt 27, which engages a threaded hole in the end of bar 26 and bears against or is swiveled in the slidable arm 25, which is fitted in a suitable slot in the bar 26. A lock-nut 28 on the bolt 27 locks it in place. In case the bolt bears against the arm 25, suitable "liners" or blocks are to be placed between the latter and the shoulders 29 of the bar 26. A headed stud or pin 30 on the bed T engages the slot-bar 26 to support and guide it. The bar 26 is pivotally connected at one end to a crank or wrist pin 31, integral with or rigidly connected to the pinion 8 above named. The controllers are slotted, as at *a*, to receive the head of pin 30. (See Figs. 5 and 6.)

The controllers 24 25 are alternately locked to the bed by suitable means, as the latch 32, which is pivotally attached to the bed or an

arm or lug thereon, as at 33. This latch is curved to fit the controllers or arms 24 25, and is operated by means of the grooved cams 34 35, which are connected and continued by the straight groove 36 in the arm or plate 37, fixed to the framing F. A roller 38 on the latch 32 runs in the said groove 36.

The operation of the above-described devices will now be described. With the parts in the positions shown in Figs. 1, 2, and 3, and moving in the directions indicated by the arrows, the bed T has nearly reached the end of its return or non-printing stroke. The gear 9 is on the point of rolling out of mesh with member 7. The latch 32 is beginning to engage with the controller 24, and, in conjunction with the end of slot 26^a of the bar 26 and pin 30, to lock the bed T to said bar to be moved thereby. The roller 19 is entering that part of cam 18 which causes the frame 12 to move downward and bring gear 8 into position to engage the member 6 of the rack-bar 5, and move gear 9 out of its position where it coacts with member 7 of the rack-bar. During the motion of the pin 31 from its highest to its lowest position (see Fig. 1) the bed T is wholly moved and controlled by the arm 24, its motion being completed, stopped, and reversed thereby. After the gear 8 engages the member 6 of the rack-bar 5, the latch 32 is moved away from the controller 24 and the bed released therefrom. The bed is now driven by the gear 8. When the bed approaches the end of its stroke to the left in Fig. 1, the pin 31 also approaches its lowest position, at which time the latch 32 is moved by the cam 34 into contact with the outer or curved face of controller 25, while the pin 30 engages the other side thereof, thus locking the bed and bar 26 together. The gear 8 now rolls out of mesh with member 6, cam 18 raises frame 12, and controller 25 completes, stops, and reverses the motion of the bed. When the pin 31 arrives at its highest point, the gear 9 meshes with member 7 of the rack-bar 5, and latch 32 is moved away from the controller 25, thus releasing the bed from the control thereof. Gear 9 now drives the bed until the bed reaches the position shown in Fig. 1, when the first-described operation is repeated, and so on. In the machine shown, the gear makes three revolutions for each complete movement of the bed, of which one revolution is while in mesh with the member 6, one-half a revolution during each completion, stoppage, and reversal of motion of the bed by the controllers, and the remaining revolution while gear 9 is in mesh with the member 7. Since the pin 31 is rigid with gear 8, it makes the same number of turns about the axis of motion of gear 8; but the invention is not limited to the form shown and described, nor to the proportions named.

In the modification shown in Fig. 7, the cylinder C is geared directly to the drive-shaft 4, which rotates in a direction contrary

to that shown in Figs. 1 and 2; the action of the gears 8 and 9 relative to the rack-bar 5 is reversed, the gear 9 driving the same during the printing instead of during the non-printing stroke of the bed; also, the latch 32 is connected with the bed to complete, stop, and reverse the non-printing motion of the bed when the pin 31 is in its lowest position and not when in its highest position, and to complete, stop, and reverse the printing motion when the pin 31 is in its highest position, and not when in its lowest position.

While for convenience of description the bed has been described as giving an impression while moving in one direction only, it must be understood that the invention is not so limited, but that it is applicable to any and all of the various forms of bed and cylinder printing-machines, as well as all machines having a reciprocating member, as planers, &c.

What I claim is—

1. The combination, with a reciprocating bed or member, and mechanism actuating the same during the greater part of its movement in either direction, of an alternating controller or arm guided by said bed and periodically engaged with the same to complete, stop and reverse such movement of the bed, substantially as described.

2. The combination, with a reciprocating bed or member, and mechanism actuating the same during the greater part of its movements in both directions, of alternating controllers or arms guided by said bed and alternately engaged with the same to complete, stop and reverse such movements of the bed, substantially as described.

3. The combination, with a reciprocating bed or member, and mechanism actuating the same during the greater part of its movements in both directions, of an alternating bar guided by said bed, and two controllers or arms borne thereby and engaged alternately with the bed to complete, stop and reverse such movements thereof, substantially as described.

4. The combination, with a reciprocating bed or member, and mechanism actuating the same during the greater part of its movements in both directions, of an alternating slotted bar, a pin on the bed which it engages, and two controllers or arms borne by said bar and engaged alternately with said bed to complete, stop and reverse the movements thereof, substantially as described.

5. The combination, with a reciprocating bed or member, and mechanism actuating the same during the greater part of its movements in both directions, of an alternating bar guided by said bed, and two controllers or arms borne thereby and one adjustable thereon, and engaged alternately with the bed to complete, stop and reverse the movements thereof, substantially as described.

6. The combination, with a reciprocating

bed or member, and mechanism actuating the same during the greater part of its movements in both directions, of an alternating slotted bar, a pin on the bed which it engages, and two controllers or arms borne by said bar and one adjustable thereon, and engaged alternately with the bed to complete, stop and reverse the movements thereof, substantially as described.

7. The combination, with a reciprocating bed or member, its rack, and two vibratory pinions alternately driving said rack and bed during the greater part of their movements in both directions, of an alternating controller or arm guided by said bed and periodically engaged therewith to complete, stop and reverse such movements thereof, substantially as described.

8. The combination, with a reciprocating bed or member, its rack, and two vibratory pinions alternately driving said rack and bed during the greater part of their movements in both directions, of alternating controllers or arms guided by said bed and alternately engaged with the same to complete, stop and reverse its movements, substantially as described.

9. The combination, with a reciprocating bed or member, its rack, and two vibratory pinions alternately driving said rack and bed during the greater part of their movements in both directions, of an alternating bar guided by said bed and two controllers or arms borne thereby and engaged alternately with the bed to complete, stop and reverse the movements thereof, substantially as described.

10. The combination, with a reciprocating bed or member, its rack, and two vibratory pinions alternately driving said rack and bed during the greater part of their movements in both directions, of an alternating slotted bar, a pin on the bed which it engages, and two controllers or arms borne by said bar and engaged alternately with the bed to complete, stop and reverse its movements, substantially as described.

11. The combination, with a reciprocating bed or member, and its rack, of a driver-pinion, two pinions driven by said driver and alternately driving said rack during the greater part of its movements, a movable frame carrying said driven pinions, and alternating controllers operated by one of said driven pinions and guided by the bed and engaged therewith alternately to complete, stop and reverse the movements thereof, substantially as described.

12. The combination, with a reciprocating bed or member, and its rack, of two pinions alternately driving said rack through the greater part of its movements, a movable frame carrying said pinions, an alternating bar operated by one of said pinions and guided on or by said bed, arms or controllers borne by said bar and alternately engaged

with said bed to complete, stop and reverse its movements, and a driver-gear operating said two pinions, substantially as described.

13. The combination, with a reciprocating
5 bed or member, of two pinions alternately driving said rack through the greater part of its movements, a movable frame carrying said pinions, a pin on said bed, an alternating slotted bar operated by one of said pinions
10 and guided on the pin on said bed, arms or controllers borne by said bar and alternately

engaged with said bed to complete, stop and reverse its movements, and a driver-gear operating said two pinions, substantially as described.

Signed at New York, in the county of New York and State of New York, this 23d day of February, A. D. 1894.

WALTER SCOTT.

Witnesses:

JAMES J. GRADY,
R. W. BARKLEY.