

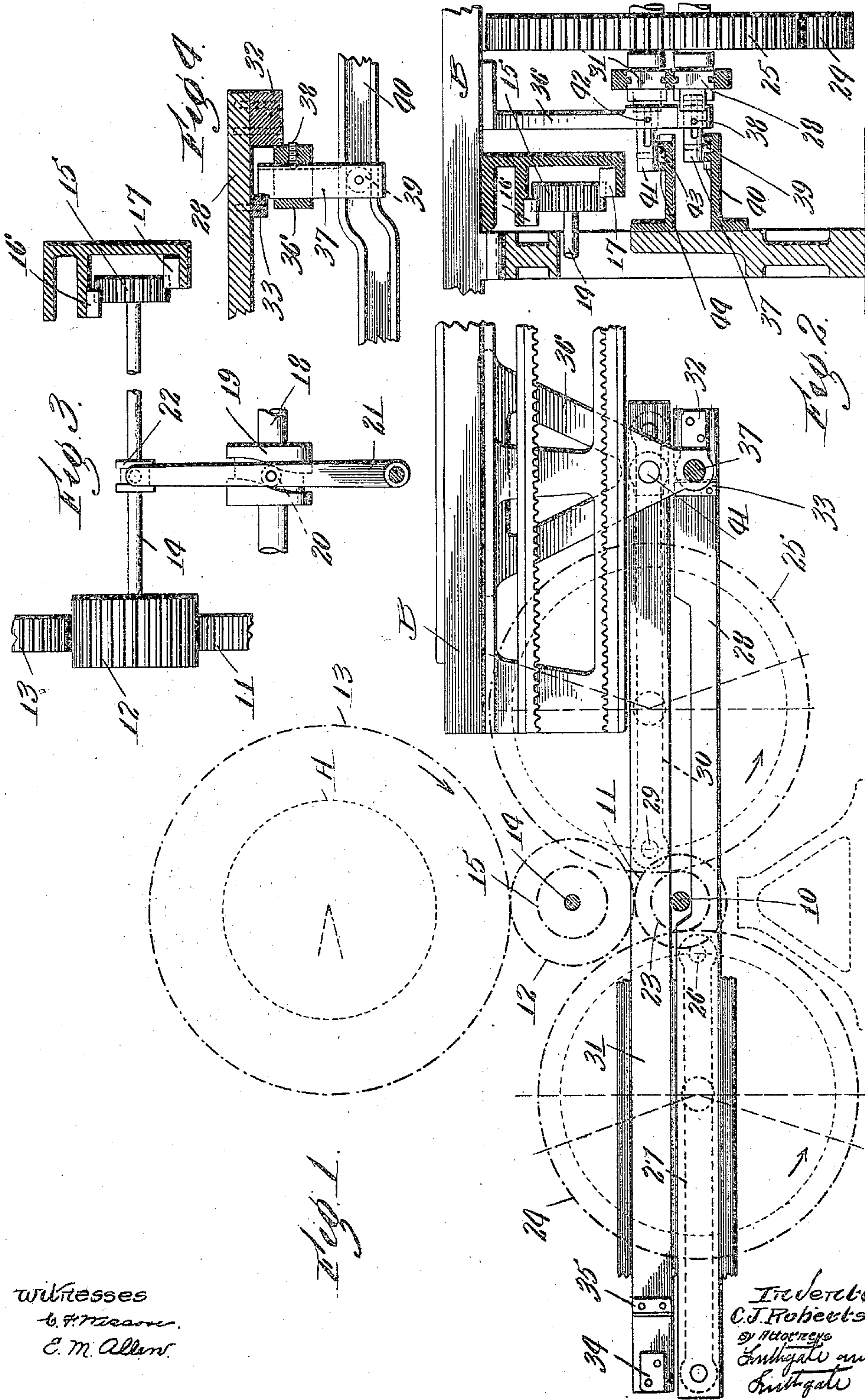
C. J. ROBERTSON.
MECHANICAL MOVEMENT.

APPLICATION FILED JULY 11, 1905. RENEWED NOV. 10, 1909.

965,941.

Patented Aug. 2, 1910.

3 SHEETS—SHEET 1.



Witnesses
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E. M. Allen.

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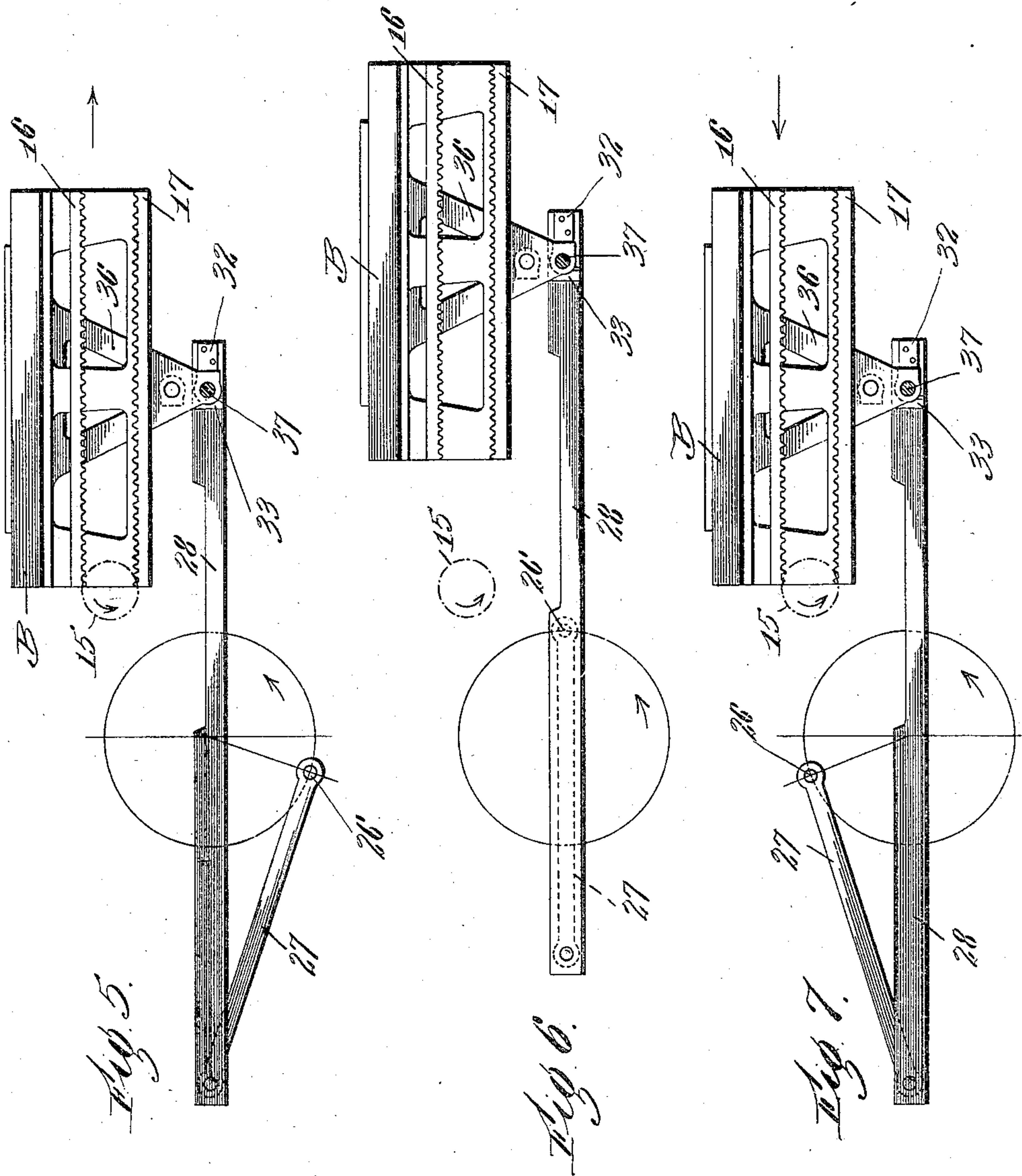
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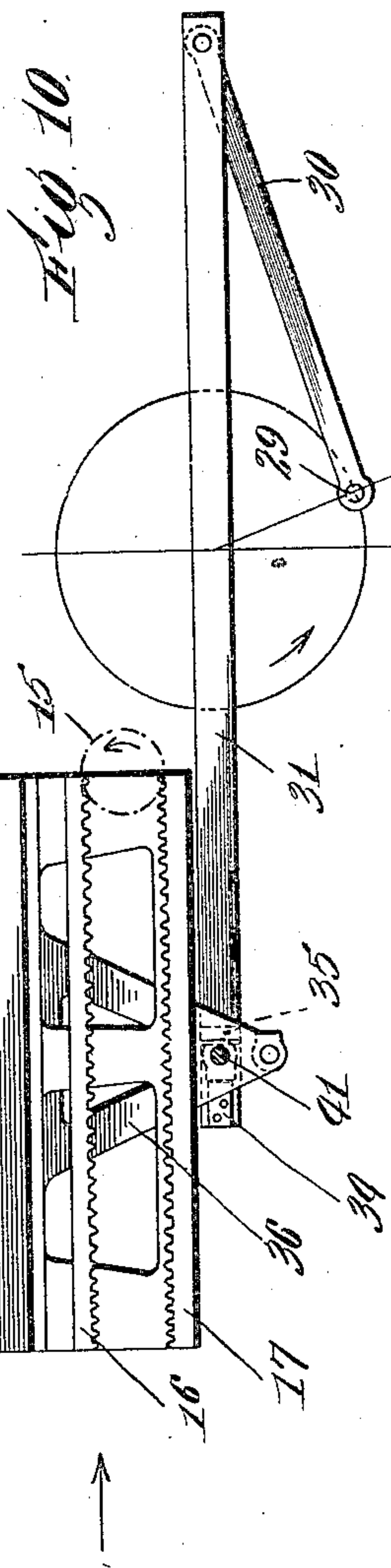
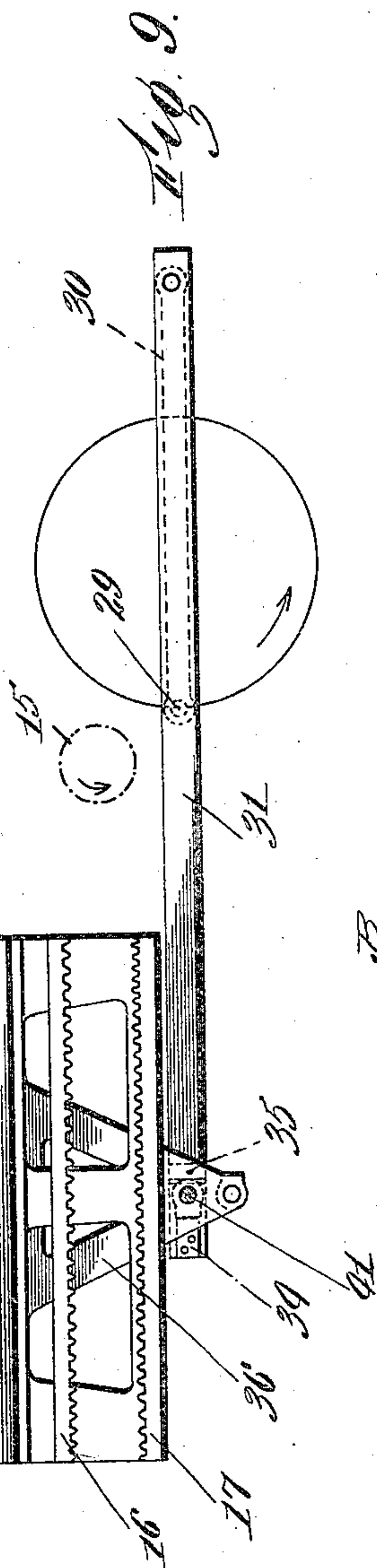
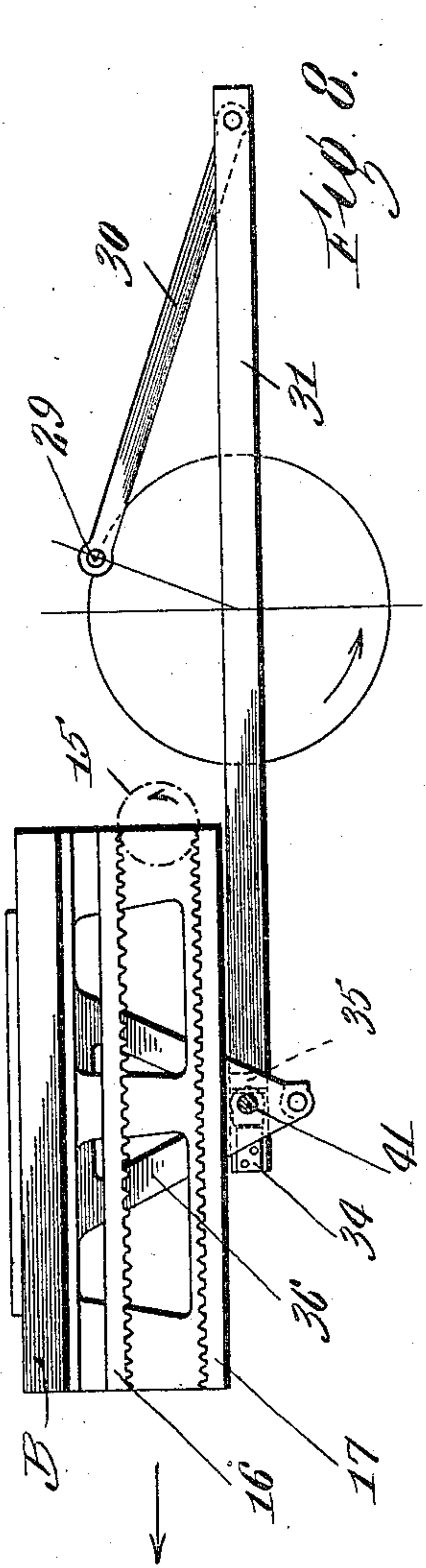
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3 SHEETS—SHEET 3.

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UNITED STATES PATENT OFFICE.

CHARLES J. ROBERTSON, OF TAUNTON, MASSACHUSETTS, ASSIGNOR TO THE CAMPBELL PRINTING PRESS & MANUFACTURING COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

MECHANICAL MOVEMENT.

965,941.

Specification of Letters Patent.

Patented Aug. 2, 1910.

Application filed July 11, 1905, Serial No. 269,264. Renewed November 10, 1909. Serial No. 527,302.

To all whom it may concern:

Be it known that I, CHARLES J. ROBERTSON, a subject of the King of England, residing at Taunton, in the county of Bristol and State of Massachusetts, have invented a new and useful Mechanical Movement, of which the following is a specification.

The object of this invention is to provide a new and improved mechanical movement for converting rotary motion into reciprocating motion.

The movement has been especially designed for reciprocating the beds of printing machines.

The movement relates to that class of apparatus in which a mechanism for giving the bed a constant speed to-and-fro movement is combined with a reversing mechanism adapted to slow down, stop, and start the bed in the opposite direction between the constant speed forward and backward movements.

The principal feature of the invention consists of two crank elements revolving vertically in the same direction, and connections from each to form a reversing mechanism. The crank elements are oppositely disposed or set at 180° relatively to each other, so that the movement can be adapted to work on the two-revolution principle. The crank elements are preferably connected through pitmen to reverse the bed, and by this arrangement the "sweet" side of each pitman reverse can be employed.

The mechanism will be best understood in detail by referring to the accompanying three sheets of drawings, in which—

Figure 1 is a side sectional elevation illustrating the mechanism. Fig. 2 is a sectional end elevation. Fig. 3 is an end elevation of the main driving mechanism. Fig. 4 is a sectional plan view illustrating the cam mechanism employed for locking the bed to the reversing mechanism. Figs. 5 to 7 are diagrammatic views illustrating one reversing action, and Figs. 8 to 10 inclusive are diagrammatic views illustrating the other reversing action.

In detail A designates the impression cylinder, and B the reciprocating bed of an ordinary two-revolution cylinder printing machine, which parts may be arranged as common, so that the bed can reciprocate under the impression cylinder.

10 designates a shaft to which power may be applied to operate the machine. This shaft carries a gear 11 which meshes with an intermediate 12, which latter meshes with a gear 13 mounted on the impression cylinder, the gear relation in this train being such that the impression cylinder will make two revolutions for each cycle or complete forward and backward reciprocations of the bed. The intermediate 12 is mounted on a shaft 14 which carries at its inner end a driving pinion 15.

Secured to the bed are upper and lower racks 16 and 17. These racks are offset laterally as shown in Fig. 3, so that the driving pinion may be moved axially to engage alternately with each rack to make up a main driving mechanism.

The intermediate gear 12 is made wide-faced as shown in Fig. 3, so that the mesh between the same and the gears 11 and 13 will not be disturbed by moving the same, the shaft 14, and the driving pinion 15 laterally.

18 designates a cam-shaft which is geared in any of the usual ways common in printing machines to turn once for each cycle of operation, or for each complete forward and backward reciprocation of the bed. Mounted on this cam-shaft is a cam 19 engaging which is a roller 20 secured on a pivoted lever 21 which engages a grooved wheel 22 secured on the shaft 14. By this arrangement a main driving mechanism of well understood construction is provided.

On the power shaft 10 is secured a pinion 23. This pinion meshes with gears 24 and 25 which preferably are arranged inside of the machine as shown in Fig. 2. Arranged on the rear gear 24 is a wrist-pin or crank-element 26 which connects by pitman 27 to a long slider 28 which is fitted in suitable ways so as to be capable of a motion parallel with the bed.

Secured on the face of the front gear 25 is a wrist-pin or crank element 29 which connects by a pitman 30 to a slider 31 fitted in ways to move just over the slider 28.

The gearing described is arranged so that the gears 24 and 25, and hence the crank-pins 26 and 29, revolve twice for each cycle or complete forward and backward reciprocation of the bed.

The slider 28 is cut away on its upper face

so that the power shaft 10 can extend into the mechanism, so that the pinion 23 can engage said gears 24 and 25. The slider 28 has secured thereto at its rear end a block 32 and a shoe 33. The slider 31 has secured thereto a block 34 and a shoe 35.

Extending down from the bed is a bracket 36. Fitted in said bracket so as to be capable of axial movement therein is a locking bolt 37. This bolt is slotted, and engaging the slot is a screw or pin 38 in said bracket to keep said bolt from turning. The bolt carries a roller 39 which engages a cam 40 secured to the framing. This cam is practically a groove made in two lines parallel with the movement of the bed, which lines are connected by an incline as shown in Fig. 4. These parts are arranged so that when the roller 39 is in that part of the groove which is nearest the side-frame, shown in Fig. 2, the bolt 37 will be retracted or inoperative; and so that when the roller is in that line of the groove which is farthest away from said side-frame, the bolt will be moved out of the bracket to lock the bed to the slider 28. The bracket is also provided with another bolt 41 just above the bolt 37 to engage the slider 31. This bolt is slotted and is kept from turning by a pin 42. The bolt 41 has a roller 43 which engages a cam 44 set above the cam 40.

A reversing action is accomplished by engagement between either of the sliders and the bracket 36, the engagement being locked either by the bolt 37 or 41, as hereinafter described. By this arrangement the "sweet" side of each pitman can be used for a reverse. The reversing action takes more than a half turn, as hereinafter described.

The operation can be followed by referring to the diagrams.

In Fig. 5 the bed is shown as just completing its constant speed return movement to the right, and the main driving mechanism becoming inoperative as the driver. In this figure the wrist-pin 26 and slider are in position so that the space between the block 32 and the shoe 33 coincides with the bolt 37 which has been moved inward in the bracket 36 by the cam 40 so as to engage the shoe 33, as shown in Fig. 4, and thus lock the slider 28 to the bed. Now as the wrist-pin 26 moves from the position shown in Fig. 5, to its dead center at the right-hand extreme, the bed will be gradually stopped and brought to a state of rest at its right-hand extreme, as shown in Fig. 6. Now as the wrist-pin 26 moves from the position shown in Fig. 6 to the position shown in Fig. 7, the bed will be started from its right-hand extreme and brought up to full working speed, bringing the parts to the position shown in Fig. 7, wherein the main driving mechanism is becoming operative as the driver. As the parts proceed from this position, the bolt 37 will be withdrawn from engagement with

the shoe 33 by the cam 40, and the bed will be taken into control by the main driving mechanism. The edge of the bolt 37 is chamfered off, and the edge of the shoe 33 is beveled, as shown in Fig. 4, so that an easy engagement can take place. It will be seen that this reversing action takes practically the "sweet" side of the pitman 27. Now as the parts proceed in operation, the bed will be given its constant speed forward movement to the left, until the wrist-pin 29 reaches the position shown in Fig. 8, wherein the main driving mechanism is becoming inoperative as the driver, and wherein the bolt 41 has been actuated to connect the slider 31 and bracket 36 depending from the bed. Now as the wrist-pin 29 moves from the position shown in Fig. 8, to its left-hand dead center, as shown in Fig. 9, the bed will be gradually stopped and brought to its left-hand extreme movement, as shown in Fig. 9. Now as the wrist-pin 29 moves from the position shown in Fig. 9 to the position shown in Fig. 10, the bed will be started on its right-hand movement at a speed gradually commencing at zero and increasing up to full speed. As the parts reach the position shown in Fig. 9, the bolt 41 will be withdrawn from the slider 31 and the bed will be taken in control by the main driving mechanism, which will give it its constant speed return movement to the right, until the wrist-pin 26 assumes the position shown in Fig. 5, from which the description of the cycle of operation was commenced. By this arrangement it will be seen that a simple and powerful mechanical movement is provided for the purpose stated.

The parts and arrangements of parts herein described may be varied by a skilled mechanic without departing from the scope of my invention as expressed in the claims.

Having thus fully described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a mechanical movement, the combination of the reciprocating bed or member, a main driving mechanism for giving the same its constant speed forward and backward movements, and a reversing mechanism comprising two crank-elements revolving in the same direction, a slider and pitman operated from one crank element, a slider and pitman operated from the other crank element, and means for connecting the sliders to the bed alternately for alternate reverse.

2. In a mechanical movement, the combination of the reciprocating bed or member, a main driving mechanism for giving the same its constant speed forward and backward movements, and a reversing mechanism comprising two crank-elements revolving in the same direction, a pitman and slider operated from one crank-element, a pitman and slider operated from the other

crank-element, and means for connecting the sliders alternately to the bed for the reversing actions, the parts being arranged to utilize the "sweet" side of each pitman reverse.

5 3. In a mechanical movement, the combination of the reciprocating bed or member, a main driving mechanism for giving the same its constant speed forward and backward movements, and a reversing mechanism comprising two crank-elements revolving twice for each cycle, said crank elements revolving in the same direction but being set at 180° relatively to each other, a pitman extending from each crank element, a slider 10 actuated by each pitman, and means for connecting the sliders alternately to the bed.

4. In a mechanical movement, the combination of the reciprocating bed or member, a main driving mechanism for giving the 15 same its constant speed forward and backward movements, and a reversing mechanism comprising two crank elements, a pitman connected to each crank element, a slider actuated by each pitman, a bracket de-

pending from the bed, locking bolts carried 25 by the bracket for locking each slider alternately to the bed, and cams for controlling the locking bolts.

5. In a mechanical movement, the combination of the reciprocating bed or mem- 30 ber, a main driving mechanism for giving the same its constant speed forward and backward movements, and a reversing mechanism comprising two revolving crank elements, a pitman connected to each crank 35 element, a slider actuated by each pitman, a bracket depending from the bed, locking bolts arranged to move laterally in said bracket, a block and a shoe carried by each slider, and means for moving the bolts to 40 lock each slider alternately to the bed.

In testimony whereof I have hereunto set my hand, in the presence of two subscribing witnesses.

C. J. ROBERTSON.

Witnesses:

ROBERT T. JOHNSTON,
M. J. MORRISON.