

Dec. 27, 1949

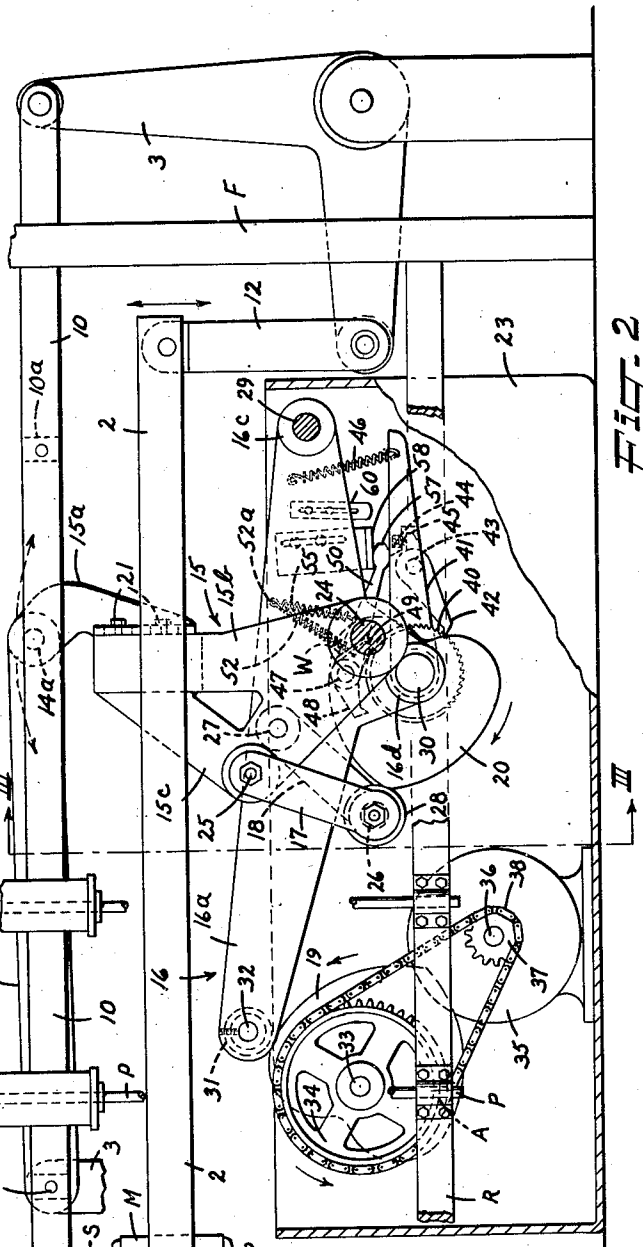
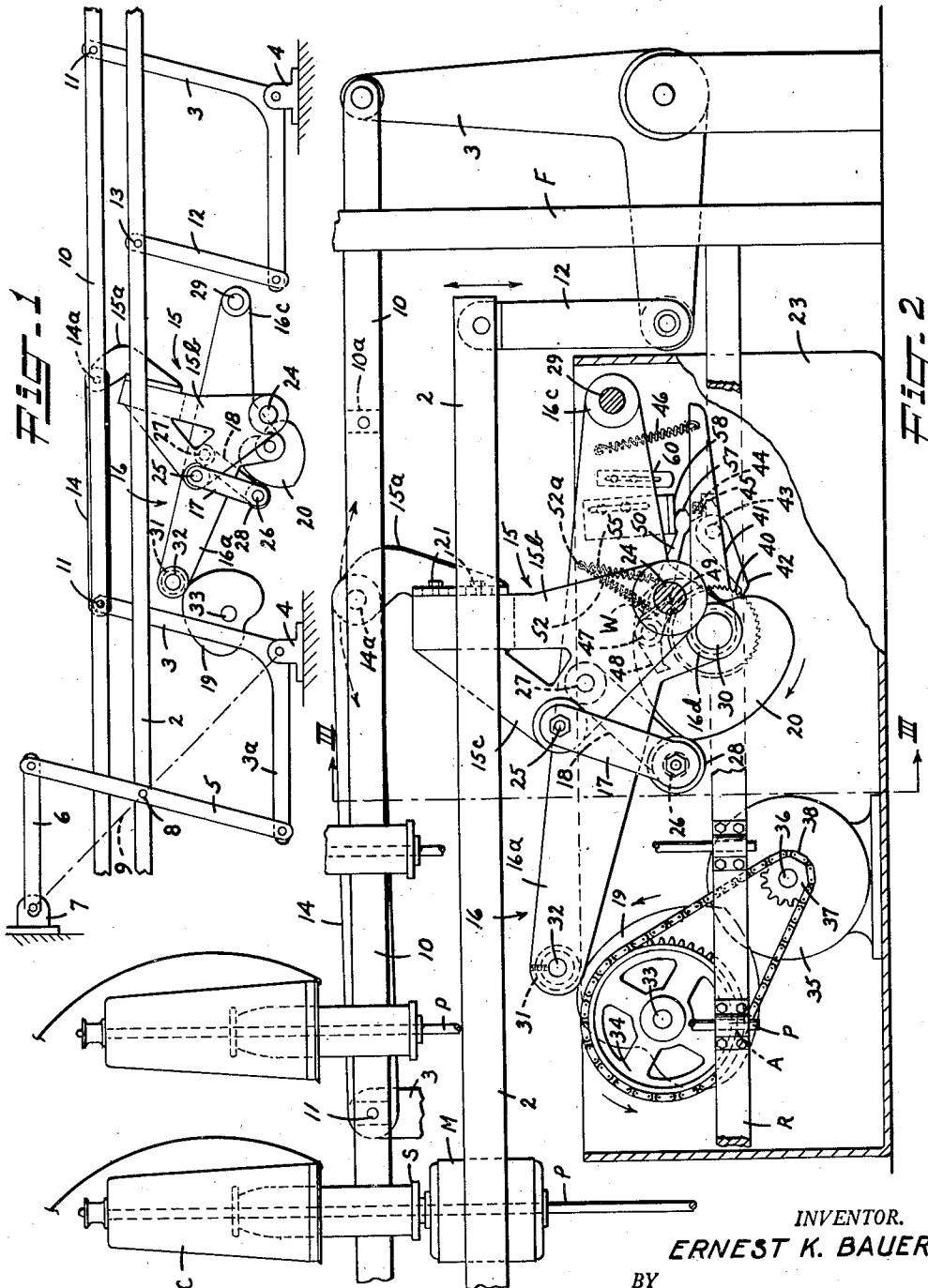
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2,492,412

TRAVERSE MECHANISM

Filed July 8, 1946

2 Sheets-Sheet 1



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TRAVERSE MECHANISM

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2 Sheets-Sheet 2

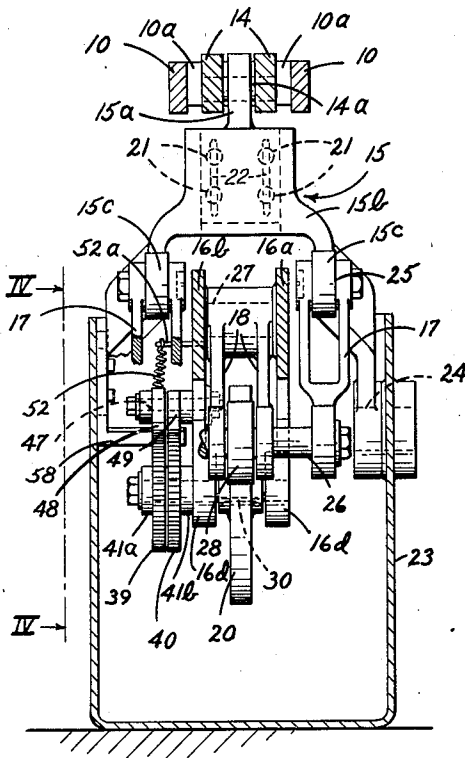


FIG. 3

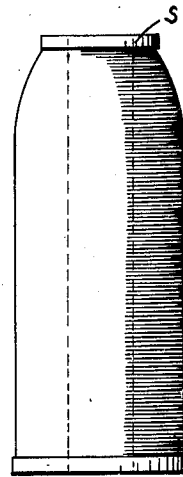


FIG. 5

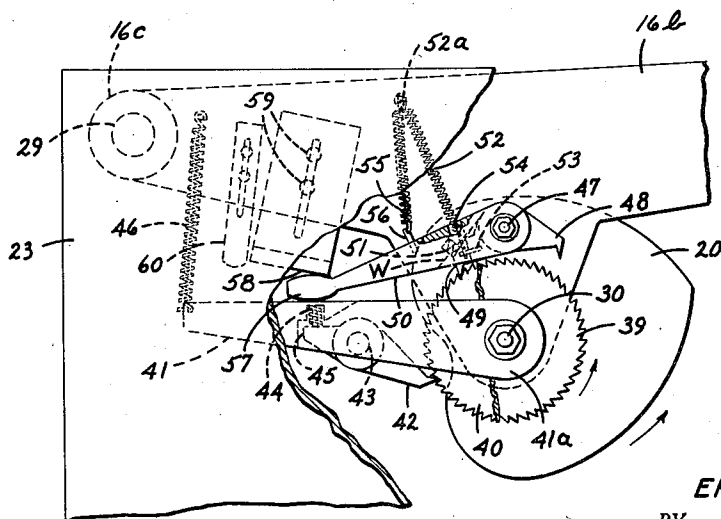


FIG. 4

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2,492,412

TRAVERSE MECHANISM

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18 Claims. (Cl. 242—43.3)

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This invention relates to a traverse mechanism including a builder mechanism for regulating the traverse in winding yarn on bobbins, particularly in a spinning or twisting frame.

It is desirable that warp yarn bobbins contain the greatest possible length of yarn and accordingly it is desirable that the windings all extend to the extreme bottom or butt of the bobbin. The upper end or tip of the full bobbin is preferably tapered, however, to prevent more than one layer of yarn being pulled off at a time, with consequent snarling of the yarn.

A principal object of this invention is to provide an improved construction of traverse mechanism in which the number of relatively sliding parts are reduced to a minimum. Thus, all of the main working parts are interconnected for relative pivotal or rotary motion rather than translational sliding movements.

A further object is to provide a traverse construction free of chains and similar relatively loose connections that are subject to stretching and the development of excessive vibration.

It is another object of this invention to provide an improved construction of traverse mechanism including a builder mechanism, by which these described results may be attained.

A more specific object is to provide a builder mechanism by which the length of the winding may be repeatedly increased and decreased, with the variation in length occurring at the tip end of the bobbin only.

The present invention further relates to certain arrangements and combinations of parts which will be hereinafter described and more particularly pointed out in the appended claims.

Further objects and advantages of the invention will be apparent from the drawing and description hereinafter.

In the drawing, illustrative of a preferred embodiment of the invention,

Figure 1 is a front elevation showing the essential linkage of the traverse mechanism,

Figure 2 is a front elevation, on a larger scale and with parts removed, showing the builder mechanism,

Figure 3 is a section through the builder mechanism taken on line III—III of Figure 2, but somewhat enlarged,

Figure 4 is a view taken on line IV—IV of Figure 3, with parts partially cut away, still further enlarged somewhat, and

Figure 5 is an elevation of a bobbin, such as may be obtained by use of the builder motion of this invention.

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As shown in the drawing, the traverse mechanism serves to reciprocate the bobbin rail 2 vertically, though it could be used to traverse any other rail transversely or longitudinally of its length. For example, in the cap twister shown, it could be applied to move the cap rail. In a ring twister, it could traverse either the ring rail or the bobbin rail. It could likewise serve to traverse a thread guide rail.

As shown more specifically in Figure 2, the rail 2 supports hollow spindle motors M for driving spools S carried thereby. Caps C are supported on stationary posts P shackled at A to a stationary rail R carried by the frame of the spinning machine comprising the end frame structure F shown.

Figure 1 particularly shows the traverse linkage comprising a plurality of bell crank levers 3 whose fulcrums are pivotally mounted in stationary supports or brackets 4.

Means is provided for constraining the motion of the rail 2 to a straight line path at right angles to the rail. This motion-controlling means is constructed of the following elements. At least one of the levers 3 has one arm 3a constituting a link connected to one end of a lever 5 which has its other end connected to a link 6 pivotally mounted on a stationary support or bracket 7. The arm 3a and link 6 may be or may not be equal in length but the rail 2 is pivotally connected to the lever 5 at a point 8 which is the point of intersection of a line 9 extending between the pivots in brackets 4 and 7 with the rail 2 when the rail is at an intermediate position, preferably near or at the mid-position of its longest stroke. It will be observed that this controlling means is free of translatory sliding motions, all links being pivotally connected.

Means is also provided for bracing the rail 2 at intervals with suitable follower levers. To accomplish this all of the levers 3 are connected to a common rod 10 at points 11 and one or more of the levers 3 (other than those connected to levers 5) are connected to links 12 which are connected to the rail 2 at 13. If desired, each lever 3 may be connected to the rail 2 by a lever 5 and in this case, no links 12 are needed. It will thus be seen that the rail 2 has a plurality of points 8 and optionally 13 at which it is supported by levers 5 and optionally links 12 and any movement of the rod 10 transfers motion to rail 2 simultaneously through levers 3, levers 5, and links 12 (when the latter are used).

Any suitable means for traversing the rail is operatively connected to the system just de-

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scribed at one of the points 11 by means of a link 14. The present invention provides an improved traversing means which comprises, as its most important elements, two levers 15 and 16 connected together by two links 17 and 18, a main cam 19, and, when a bottle-shaped winding is desired, a builder cam 20.

The relationship of these parts is best shown in Figures 2 to 4 inclusive. While the terms "rod," "lever" and "link" used herein generally connote elements of simple structure, it is to be understood that they include simple and composite structures as well, the latter being shown specifically herein in many instances. For example, rod 10 actually comprises two parallel rods bolted together at intervals with spacing elements 10a therebetween (see Figure 2).

The lever 15 (Figures 2 and 3) is pivotally connected to link 14 at 14a and has two parts 15a and 15b adjustably connected by bolts or cap screws 21 extending through slots 22 in the upper part 15a. This adjustment makes it possible to vary the length of the stroke. Lengthening lever 15 increases the length of stroke and vice versa. The lower part 15b of lever 15 is bifurcated and each leg thereof is pivotally connected to a supporting housing 23 in bearings 24. Each leg has a laterally projecting portion 15c having a pivotal connection at 25 with a link 17 which as shown may be bifurcate at the pivot mentioned. A shaft or pivotal bearing 25 is carried by the two lower ends of the links 17. The link 18 is likewise bifurcate (see Figure 3) and the lower end of each leg thereof is pivotally carried on bearing 26. The upper end of link 18 is pivotally mounted on a bearing 27 which extends into and is carried by the two legs 16a and 16b of lever 16 which is also bifurcate. A cam follower roller 28 is carried on bearing 26 between the legs of link 18 so that it is in position to engage the builder cam 20 when such is in use.

The legs 16a and 16b are joined with a common bearing sleeve 16c (Figure 2) pivotally carried on a bearing 29 suitably mounted in the housing 23. Each leg 16a and 16b has laterally projecting portions provided with bearing sleeves 16d within which a shaft 30 is rotatably supported. The cam 20 is keyed to the shaft 30 for rotation therewith.

A cam follower roller 31 is carried rotatably on a shaft 32 secured in the ends of the legs 16a and 16b of the lever 16 so that the roller is between the legs and engages cam 19.

Cam 19 is keyed to shaft 33 which is mounted rotatably in bearings on the housing 23 and is driven by a sprocket 34 also keyed on the shaft. A constant speed motor 35 drives the cam 19 through shaft 36, sprocket 37, and chain 38.

Assuming that the builder cam 20 is replaced by a cylindrical member, such as a roll or disk, and that cam 19 is designed to provide constant rail speed with such cylindrical member 20, the operation of the mechanism so far described is as follows: Rotation of cam 19 alternately lifts and lowers roll 31 thereby swinging lever 16 up and down on its pivotal bearing 29. This motion of lever 16 is transferred through links 18 and 17 to the bearing 25 on lever 15 which is thereby rocked about bearing 24. Since the cam 20 is replaced with a cylindrical member, and rotation of such member has no effect on the linkage so that the motion of the pivotal connection 14a is an oscillatory one between two definite limits. This motion is transferred by link 14 to the rod 10 and thereby to all of the bell crank levers 3 by which

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it is in turn transferred to the rail 2 through lever or levers 5 and the link or links 12. Levers 5, as stated previously constrain the motion of rail 2 to a straight-line path which is vertical in the embodiment shown. The result is the production of a winding of uniform depth across the full length or height of the bobbin.

A tapered package of any desired shape can be produced by changing cam 19, or cam 20, or a combination of both.

When it is desired to produce a tapered top or "bottle"-shaped winding, a builder cam 20 may be used and the mechanism for operating it is as follows: As shown in Figures 2 and 3 and particularly in Figure 4, the shaft 30 has fixed to it for rotation therewith two ratchets 39 and 40 with teeth oppositely directed. A bifurcate lever 41 has its legs 41a and 41b straddling the ratchets 39 and 40 and pivotally mounted on the shaft 30. In the crotch of the lever 41 a driving pawl 42 is pivotally mounted on a shaft 43 carried by the legs of lever 41. This pawl 42 drives ratchet 40. A spring 44 in a recess formed in the crotch of lever 41 preferably is provided to bear against a lug 45 carried by the pawl 42 and resiliently take up slack and shock in operation. A spring 46 is attached to the free end of lever 41 and to the leg 16b of lever 16 and normally pulls the lever 41 in a clockwise direction as viewed in Figure 4.

Leg 16b of lever 16 carries a stub shaft 47 upon which there are rotatably mounted a return check pawl 48 and a forward check or locking pawl 49 which co-operate with ratchets 39 and 40 respectively. These pawls 48 and 49 are straddled by the legs of a bifurcate lever 50 also rotatably mounted on shaft 47. A spring 51 disposed in a recess formed in the crotch of lever 50 bears against the locking pawl 49. Another spring 52 is secured to a pin 53 secured to a lug projecting back from the pawl 48. This spring passes through a bore 54 through the crotch of lever 50 to a point of securement on a pin 52a carried by leg 16b of lever 16 and normally biases the pawl 48 in a clockwise direction about shaft 47 to the limiting position shown (relative to lever 50) in which the lug thereon carrying pin 53 bears against the back wall of the crotch of lever 50 (the upper inside wall indicated by the sloped dotted line w). Still another spring 55 is attached at 52a to leg 16b of lever 16 and a pin 56 secured to lever 50 and biases the lever in a clockwise direction about shaft 47. The lever 50 has an end portion 57 which engages the top of lever 41 and the lower surface of a detent 58 which is adjustably secured to the inside wall of the housing 23 by cap screws 59. Preferably, this end portion 57 is provided with rounded bearing surfaces, as shown. A limiting detent or stop member 60 is adjustably secured to leg 16b of lever 16 and serves to limit the return stroke of lever 41 carrying pawl 42.

With the builder mechanism described, it is possible to obtain various effects by selection of differently shaped as well as different sizes of main cams 19 and builder cams 20. To obtain a "bottle"-shaped winding such as is shown in Figure 5, links 17 and 18 must have equal length and the size of the cam 19 is selected so that the axis of pivotal bearing 25 is coaxial with that of the pivotal bearing 27 when roller 31 is at the highest point of cam 19. This assures that in spite of the changes in the linkage caused by the relative shifting of roller 28 on pivotal bearing 26 by the builder cam 20, one end of its stroke is always at a fixed point. As the builder mechanism is

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connected to the rail 2, this fixed point corresponds to the lower end of the winding on the bobbin and all the changes of stroke take place at the upper end of the stroke.

However, if links 17 and 18 are of unequal lengths, or if the rise of cam 19 is insufficient to cause pivots 25 and 27 to reach the coaxial relationship, builder cam 20 will shift both ends of the stroke and a winding tapered at both ends is obtained. The character of the taper can be varied by selection of the shape of the cam as well as by changing the adjustment of stop 60, which latter changes the frequency of rotation of the builder cam relative to the frequency of the cam 19.

To explain the operation of the builder in more detail, assume the mechanism is in the position shown in Figure 2 to start. Cam 19 is lifting lever 16 about its pivot 29, and the upward swinging of shafts 30 and 47 causes levers 50 and 41 to swing clockwise about their shafts (as viewed in Figure 2) since they are in engagement with the stationary detent 58. This swinging of lever 41 causes pawl 42 to rotate ratchet 40 and builder cam 20 in the direction of the arrow. After roller 31 passes beyond the maximum point of rise of cam 19, lever 16 swings downwardly on its pivot 29 and levers 50 and 41 are swung back, the spring 46 keeping them always in engagement and against detent 58 until lever 41 strikes stop 60. When lever 41 strikes stop 60 it no longer rotates on its pivot or shaft 39. Thus the adjustment of stop 60 predetermines the extent of relative rotation of lever 41 relative to shaft 30 during the rising motion of the lever 16. This (together with the adjustment of stop 58) predetermines the number of teeth of the ratchet which are racked forward by pawl 42 carried on lever 41 during each swing of lever 16 and consequently the frequency of rotation of cam 20 relative to cam 19 can be predetermined in this way.

The rotation of cam 20 shifts link 17 and hence lever 15 relative to the pivotal connection of link 17 to lever 16. This varies the extent of swing of lever 15 on its pivot 24 relative to the swing of lever 16. When roller 28 is at the lowest point of cam 20, the greatest swing of lever 15 is obtained for a given swing of lever 16; and similarly when the roller 28 is at the highest point of the builder cam 20, the smallest swing of lever 15 is obtained.

The builder mechanism may be used with reciprocable rails supported in any suitable fashion other than that specifically disclosed herein.

It is to be understood that changes and variations may be made without departing from the spirit and scope of the invention as defined in the appended claims.

I claim:

1. A machine for winding a yarn or the like comprising a rail, a plurality of bell crank levers mounted in parallel relationship, means for swinging said levers in unison, supporting means for the rail carried by said levers, and means for constraining the motion of said rail to a straight line, said last-named means consisting of links pivotally interconnected for relative pivotal motion exclusively.

2. A machine for winding a yarn or the like comprising a rail, a plurality of bell crank levers mounted in parallel relationship, a common rod connecting corresponding arms of the levers together, means for reciprocating the rod, parallel links pivotally connecting the other arms of the

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levers to the rail, at least one of said links projecting beyond its pivotal connection with the rail, another link pivotally connected to the projecting end of said projecting link and to a fixed bearing at a position displaced away from the rail and the projecting link diagonally opposite to the arm of the lever associated with said projecting link.

3. A machine for winding a yarn or the like comprising a reciprocable rail, supporting means for the rail comprising a lever, two links pivotally secured to the lever, one adjacent each end thereof, said links being secured pivotally to fixed members offset from the lever on opposite sides thereof, said rail being pivotally attached to the lever at such a position that when the pivotal connection coincides with the point of intersection of the lever with a line drawn between the pivotal connections of the links to the fixed members, the rail is near the mid-position of its stroke, and means connected to one of the links for oscillating said supporting means with the rail.

4. A machine for winding a yarn or the like comprising a rail, a plurality of bell crank levers mounted in parallel relationship, means for swinging said levers in unison, supporting means for the rail carried by said levers; said supporting means comprising a link pivotally connected to a stationary bracket at a position offset from that side of the rail away from the fulcrums of the bell crank levers and also offset from the fulcrum of one of said levers in a direction parallel to the rail, a lever connecting said link to an arm of said bell crank lever disposed entirely to one side of said rail, and a pivotal connection between said connecting lever and said rail so located that when said connection lies on a straight line extending between said fulcrum and said offset position the rail is near the mid-position of its stroke whereby the motion of said rail is constrained to a straight line.

5. A machine for winding a yarn or the like comprising a rail, means for constraining the motion of said rail to a straight-line, and builder motion means for reciprocating the rail, said reciprocating means comprising a lever pivotally mounted on a fixed axis, a second lever pivotally mounted on a fixed axis offset from that of the first and operatively connected to the rail to transmit reciprocating motion thereto, means for oscillating the first lever about its axis, a link pivotally connected to the first lever, and a second link pivotally connected to the second lever and to the first link.

6. A machine for winding a yarn or the like comprising a rail, means for constraining the motion of said rail to a straight-line, and builder motion means for reciprocating the rail, said reciprocating means comprising a lever pivotally mounted on a fixed axis, a second lever pivotally mounted on a fixed axis offset from that of the first and operatively connected to the rail to transmit reciprocating motion thereto, means for oscillating the first lever about its axis, a link pivotally connected to the first lever, a second link pivotally connected to the second lever and to the first link, and means carried by the first lever for predeterminedly controlling the disposition of the pivotal connection between the links relative to the first lever.

7. A machine for winding a yarn or the like comprising a rail, means for constraining the motion of said rail to a straight-line, and builder motion means for reciprocating the rail, said re-

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reciprocating means comprising a lever pivotally mounted on a fixed axis, a second lever pivotally mounted on a fixed axis offset from that of the first and operatively connected to the rail to transmit reciprocating motion thereto, means for oscillating the first lever about its axis, a link pivotally connected to the first lever, a second link pivotally connected to the second lever and to the first link, and a cam carried by the first lever for predeterminedly controlling the disposition of the pivotal connection between the links relative to the first lever.

8. In a spinning or twisting machine, a rail, a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, means for oscillating the lever about its axis, a link pivotally mounted on the lever at a position offset from its axis and suspended therefrom, a second lever connected to the rail and pivotally mounted on a fixed axis offset from the first two axes, a link of the same length as the first link pivotally mounted on the second lever on an axis offset from that of the second lever and pivotally connected to the first link on an axis offset from the pivotal connection of said first link with the first lever, the dispositions of said axes being so related that the projected path of the pivotal connection of the first link with the first lever about the axis of said lever as a center intersects the projected path of the pivotal connection of the second link with the second lever about the axis of said lever, and means carried by the first lever for predeterminedly controlling the disposition of the pivotal connection between the links relative to the first lever.

9. In a spinning or twisting machine, a rail, a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, cam means for oscillating the lever about its axis, a link pivotally mounted on the lever at a position offset from its axis and suspended therefrom, a second lever connected to the rail and pivotally mounted on a fixed axis offset from the first two axes, a link of the same length as the first link pivotally mounted on the second lever on an axis offset from that of the second lever and pivotally connected to the first link on an axis offset from the pivotal connection of said first link with the first lever, the dispositions of said axes being so related that the projected path of the pivotal connection of the first link with the first lever about the axis of said lever as a center intersects the projected path of the pivotal connection of the second link with the second lever about the axis of said lever, a cam carried rotatably by the first lever and having its periphery in engagement with the pivotal connection between the two links, and means carried by the first lever for rotating the cam step by step in response to the swinging of the first lever.

10. In a spinning or twisting machine, a rail, a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, cam means for oscillating the lever about its axis, a link pivotally mounted on the lever at a position offset from its axis and suspended therefrom, a second lever connected to the rail and pivotally mounted on a fixed axis offset from the first two axes, a link of the same length as the first link pivotally mounted on the second lever on an axis offset from that of the second lever and pivotally connected to the first link on an axis offset from the pivotal connection of said first link with the first lever, the dispositions of said axes being so related that the projected path of the pivotal connection of the first link with

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the first lever about the axis of said lever as a center intersects the projected path of the pivotal connection of the second link with the second lever about the axis of said lever, a cam carried rotatably by the first lever and having its periphery in engagement with the pivotal connection between the two links, means carried by the first lever for rotating the cam step by step in response to the swinging of the first lever, and means for adjusting the length of the second lever.

11. In a spinning or twisting machine, a rail, a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, cam means for oscillating the lever about its axis, a link pivotally mounted on the lever at a position offset from its axis and suspended therefrom, a second lever connected to the rail and pivotally mounted on a fixed axis offset from the first two axes, a link of the same length as the first link pivotally mounted on the second lever on an axis offset from that of the second lever and pivotally connected to the first link on an axis offset from the pivotal connection of said first link with the first lever, the dispositions of said axes being so related that the projected path of the pivotal connection of the first link with the first lever about the axis of said lever as a center intersects the projected path of the pivotal connection of the second link with the second lever about the axis of said lever, a cam carried rotatably by the first lever and having its periphery in engagement with the pivotal connection between the two links, means carried by the first lever for rotating the cam step by step in response to the swinging of the first lever comprising a lever rotatably mounted coaxially with respect to the cam, a ratchet mounted coaxially with respect to the cam for simultaneous rotation therewith, a pawl carried by said coaxially mounted lever for driving the ratchet, a stationary detent for swinging said coaxially mounted lever to cause the pawl to drive the ratchet and thereby the cam during at least part of the stroke of the first lever.

12. In a spinning or twisting machine, a rail, a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, cam means for oscillating the lever about its axis, a link pivotally mounted on the lever at a position offset from its axis and suspended therefrom, a second lever connected to the rail and pivotally mounted on a fixed axis offset from the first two axes, a link of the same length as the first link pivotally mounted on the second lever on an axis offset from that of the second lever and pivotally connected to the first link on an axis offset from the pivotal connection of said first link with the first lever, the dispositions of said axes being so related that the projected path of the pivotal connection of the first link with the first lever about the axis of said lever as a center intersects the projected path of the pivotal connection of the second link with the second lever about the axis of said lever, a cam carried rotatably by the first lever and having its periphery in engagement with the pivotal connection between the two links, means carried by the first lever for rotating the cam step by step in response to the swinging of the first lever comprising a lever rotatably mounted coaxially with respect to the cam, a ratchet mounted coaxially with respect to the cam for simultaneous rotation therewith, a pawl carried by said coaxially mounted lever for driving the ratchet, a stationary detent for swinging said

coaxially mounted lever to cause the pawl to drive the ratchet and thereby the cam during at least part of the stroke of the first lever, and a detent fixed on the first lever for limiting the return swing of the coaxially mounted lever relative to the first lever.

13. In a spinning or twisting machine, a rail, a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, cam means for oscillating the lever about its axis, a link pivotally mounted on the lever at a position offset from its axis and suspended therefrom, a second lever connected to the rail and pivotally mounted on a fixed axis offset from the first two axes, a link of the same length as the first link pivotally mounted on the second lever on an axis offset from that of the second lever and pivotally connected to the first link on an axis offset from the pivotal connection of said first link with the first lever, the dispositions of said axes being so related that the projected path of the pivotal connection of the first link with the first lever about the axis of said lever as a center intersects the projected path of the pivotal connection of the second link with the second lever about the axis of said lever, a cam carried rotatably by the first lever and having its periphery in engagement with the pivotal connection between the two links, means carried by the first lever for rotating the cam step by step in response to the swinging of the first lever comprising a lever rotatably mounted coaxially with respect to the cam, a ratchet mounted coaxially with respect to the cam for simultaneous rotation therewith, a pawl carried by said coaxially mounted lever for driving the ratchet, a stationary detent for swinging said coaxially mounted lever to cause the pawl to drive the ratchet and thereby the cam during at least part of the stroke of the first lever, a detent fixed on the first lever for limiting the return swing of the coaxially mounted lever relative to the first lever, both of said detents being adjustable, and means for adjusting the length of the second lever.

14. A machine for winding a yarn or the like comprising a reciprocable rail and a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, means for oscillating the lever about its axis, a second lever pivotally mounted on a fixed axis offset from that of the first and linkage means operatively connecting the second lever to the rail to transmit reciprocating motion thereto, a link pivotally connected to the first lever, a second link having a length equal to that of the first link and being pivotally connected to the second lever and to the first link, and means for predeterminedly controlling the disposition of the pivotal connection between the links relative to the first lever.

15. A machine for winding a yarn or the like comprising a reciprocable rail and a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, means for oscillating the lever about its axis, a second lever pivotally mounted on a fixed axis offset from that of the first and linkage means operatively connecting the second lever to the rail to transmit reciprocating motion thereto, a link pivotally connected to the first lever, a second link having a length equal to that of the first link and being pivotally connected to the second lever and to the first link, and means carried by the first lever for predeterminedly controlling

the disposition of the pivotal connection between the links relative to the first lever.

16. A machine for winding a yarn or the like comprising a reciprocable rail and a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, means for oscillating the lever about its axis, a second lever pivotally mounted on a fixed axis offset from that of the first and linkage means operatively connecting the second lever to the rail to transmit reciprocating motion thereto, a link pivotally connected to the first lever, a second link having a length equal to that of the first link and being pivotally connected to the second lever and to the first link, a cam rotatably carried on the first lever and having its periphery in engagement with the pivotal connection between the two links, and means for rotating the cam.

17. A machine for winding a yarn or the like comprising a reciprocable rail and a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, means for oscillating the lever about its axis, a second lever pivotally mounted on a fixed axis offset from that of the first and linkage means operatively connecting the second lever to the rail to transmit reciprocating motion thereto, a link pivotally connected to the first lever, a second link having a length equal to that of the first link and being pivotally connected to the second lever and to the first link, a cam rotatably carried on the first lever and having its periphery in engagement with the pivotal connection between the two links, and means carried by the first lever for rotating the cam at a predetermined frequency relative to the frequency of oscillation of the first lever.

18. A machine for winding a yarn or the like comprising a reciprocable rail and a builder mechanism for reciprocating the rail comprising a lever pivotally mounted on a fixed axis, rotating cam means for oscillating the lever about its axis, a second lever pivotally mounted on a fixed axis offset from that of the first and linkage means operatively connecting the second lever to the rail to transmit reciprocating motion thereto, a link pivotally connected to the first lever, a second link having a length equal to that of the first link and being pivotally connected to the second lever and to the first link, a cam rotatably carried on the first lever and having its periphery in engagement with the pivotal connection between the two links, and means carried by the first lever for rotating the cam at a predetermined frequency relative to the frequency of oscillation of the first lever.

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