

June 21, 1949.

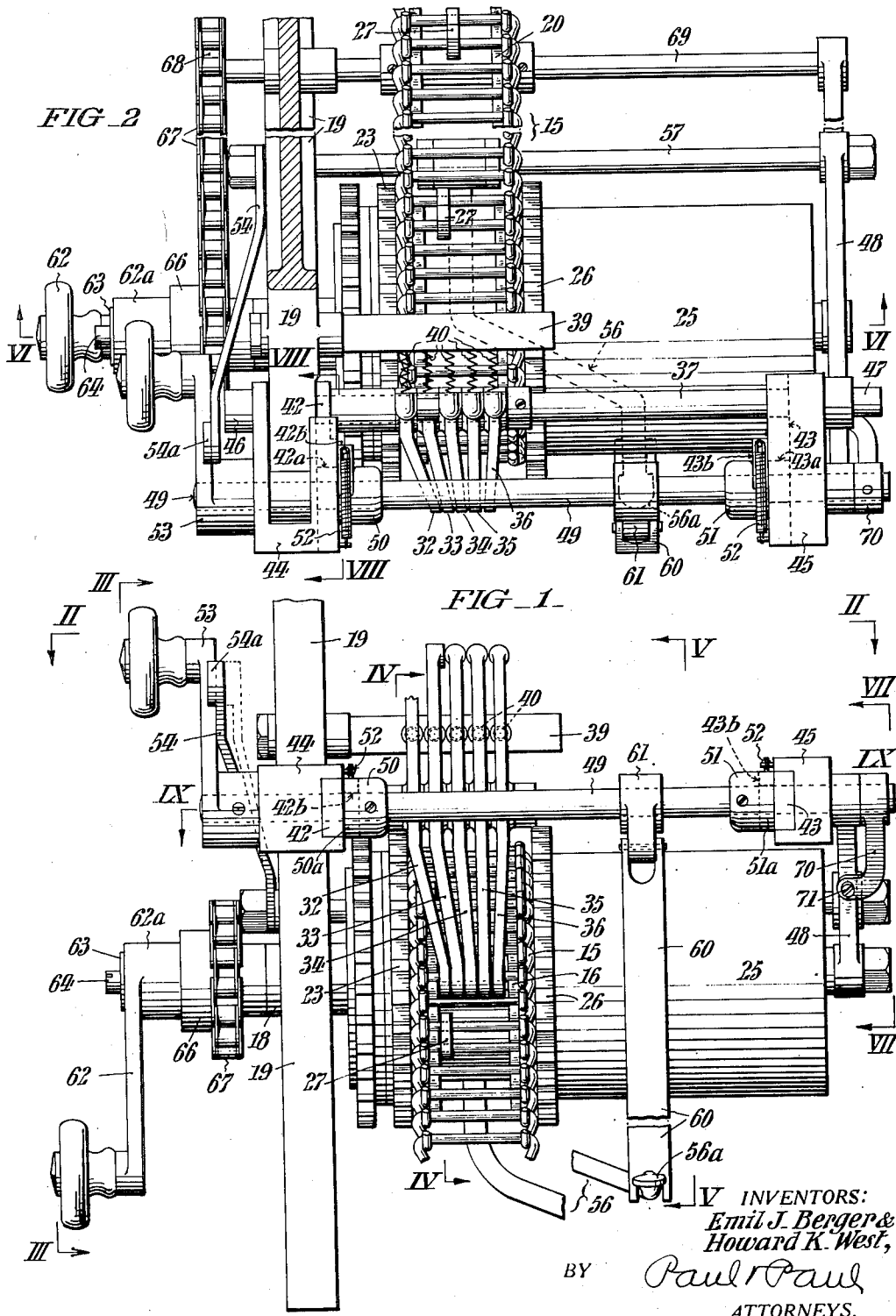
E. J. BERGER ET AL

2,473,503

PATTERN MECHANISM FOR KNITTING MACHINES

Filed Jan. 3, 1948

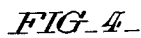
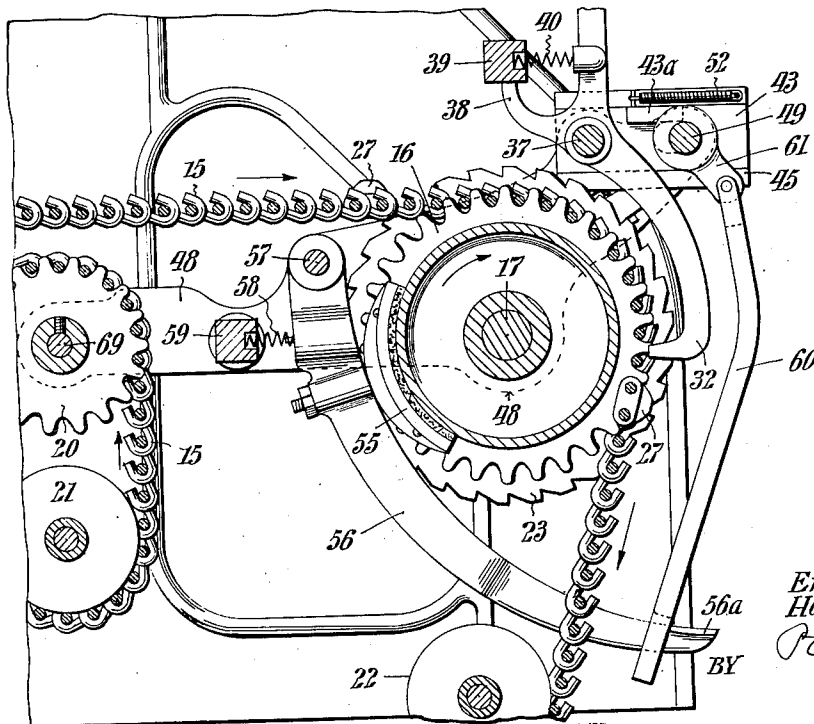
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# PATTERN MECHANISM FOR KNITTING MACHINES

4 Sheets-Sheet 2



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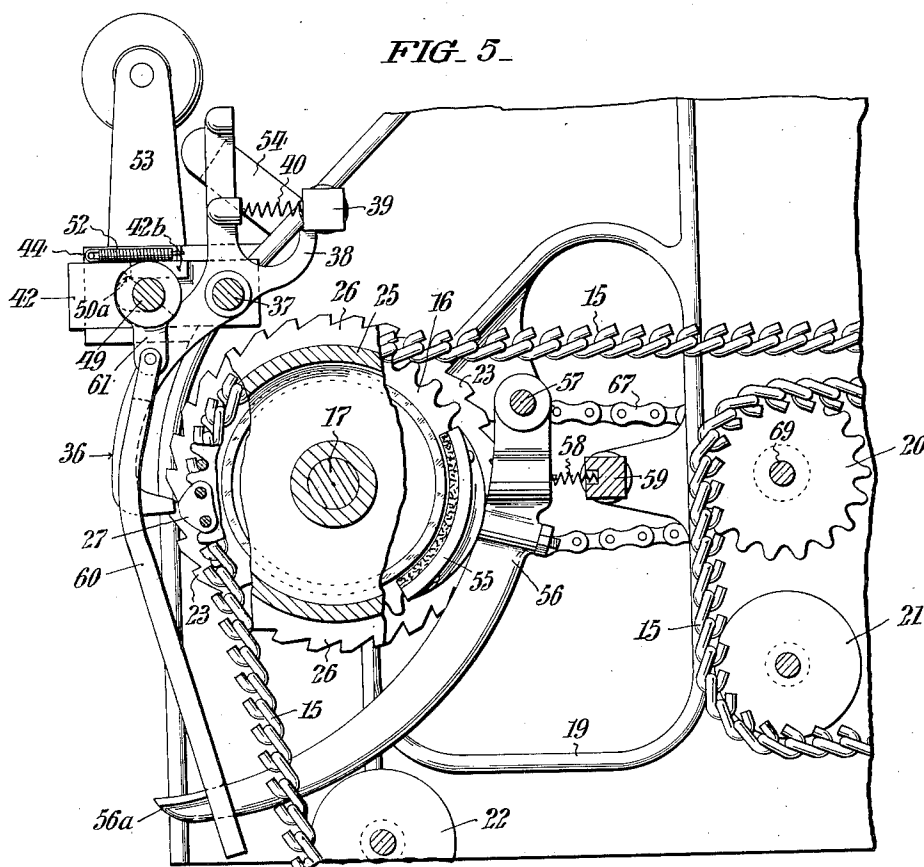
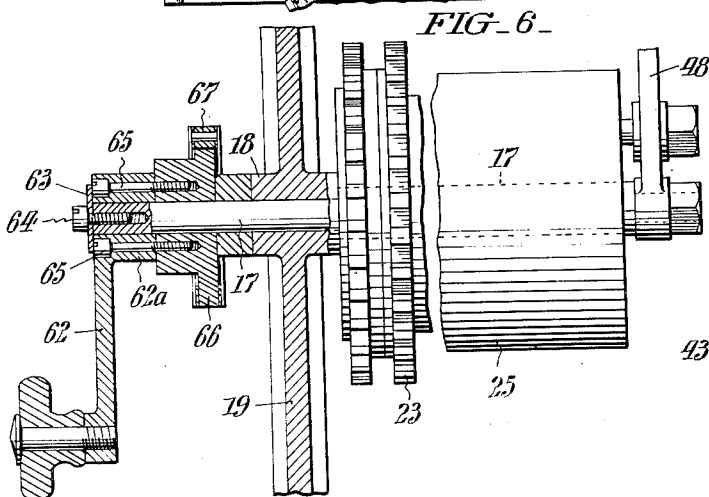
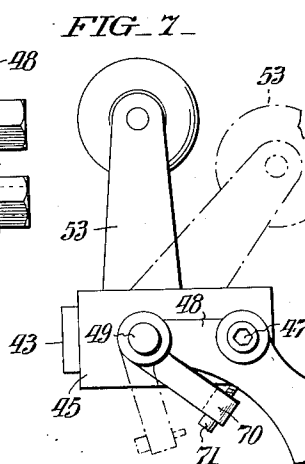
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PATTERN MECHANISM FOR KNITTING MACHINES

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4 Sheets-Sheet 3



WITNESSES

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4 Sheets-Sheet 4

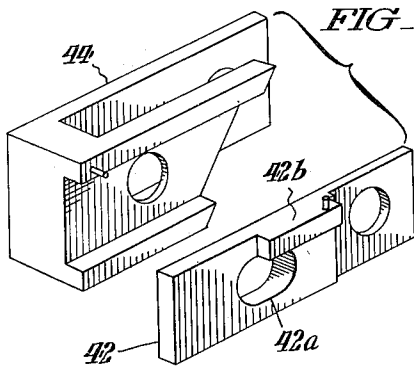


FIG. 10

FIG. 11

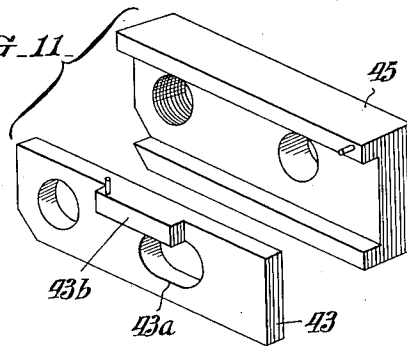


FIG. 8

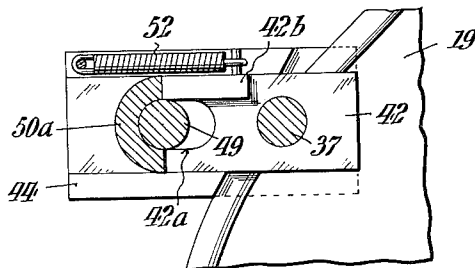


FIG. 12

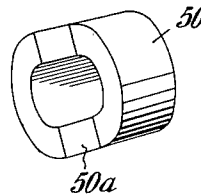
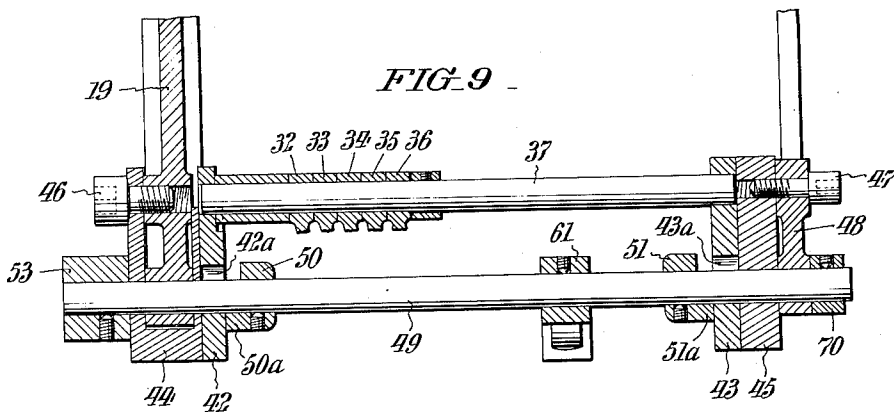


FIG. 9



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## UNITED STATES PATENT OFFICE

2,473,503

## PATTERN MECHANISM FOR KNITTING MACHINES

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Application January 3, 1948, Serial No. 409

5 Claims. (Cl. 66—154)

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This invention relates to pattern mechanisms for knitting machines, particularly straight knitting machines of the "Cotton" type such as are commonly used in the commercial production of full-fashioned stocking blanks and the like, wherein the timing and functioning of various sub-mechanisms during each operative cycle of the machines is governed, through intermediate connections, by control elements in the form of fingers arranged to be actuated by cam projections on endless timing chains as the latter pass about intermittently rotated sprocket wheels. Such mechanisms are ordinarily provided with facilities whereby the chains may be reset to starting position after stoppages of the machines before completion of normal operative cycles upon detection of imperfections in the stocking blanks under production.

With control mechanisms as heretofore usually constructed, such resettings of the chains were attended by actuation of the fingers with consequent disadvantageous disturbance of the control mechanisms individually governed by them.

Our invention is directed toward overcoming the above drawback which objective is made possible of realization in practice as hereinafter more fully disclosed, through provision of simple and inexpensive means capable of ready incorporation in pattern mechanisms of existent knitting machines, whereby the fingers can be bodily retracted to a position beyond the range of the timing chains during the resettings so that they can be accomplished without incidental disturbance of the sub-mechanisms individually controlled by the fingers.

Other objects and attendant advantages will appear from the following detailed description of the attached drawings, wherein Fig. 1 is a fragmentary view in front elevation of a pattern mechanism for a straight full-fashioned stocking knitting machine conveniently embodying our invention, and generally of the type disclosed in U. S. Patent 1,982,991, granted to Kenneth Howie and Charles C. Krieble on December 4, 1934.

Fig. 2 is a fragmentary horizontal section taken as indicated by the angled arrows II—II in Fig. 1.

Fig. 3 is a fragmentary view in end elevation looking as indicated by the angled arrows III—III in Fig. 1.

Fig. 4 is a transverse section taken as indicated by angled arrows IV—IV in Fig. 1, showing the parts of the pattern control mechanism in their normal positions.

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Fig. 5 is a transverse section taken as indicated by angled arrows V—V with the fingers retracted from active position relative to the timing chain.

Fig. 6 is a fragmentary view in transverse section taken as indicated by the angled arrows VI—VI in Fig. 3.

Fig. 7 is a fragmentary view in end elevation looking as indicated by the angled VII—VII in Fig. 1.

Fig. 8 is a detail section taken as indicated in the angled arrows VIII—VIII in Fig. 2.

Fig. 9 is a fragmentary view in section taken as indicated between angled arrows in IX—IX in Fig. 1, and

Figs. 10, 11, 12 are perspective views of different component parts of the means by which the fingers are supported so as to be retractable from the timing chain.

With more detailed reference first more particularly to Figs. 1–5 of these illustrations, the numeral 15 designates the endless timing chain of the pattern mechanism which is trained about a sprocket drum 16 free on a shaft 17 extending through a bearing boss 18 on an end frame 19 of the knitting machine. The chain 15 is constrained to travel in a definite circuit by a number of idler wheels including a toothed wheel 20 and several plain wheels of which latter two are indicated at 21 and 22 in Figs. 3 and 5. Secured to or integrally formed with the sprocket drum 16 at one end thereof is a ring of ratchet teeth 23. By means of a pawl (not illustrated) the ratchet teeth 23 are picked in a well known way to intermittently rotate the sprocket drum 16 in the direction of the arrow in Fig. 4. Associated with the sprocket drum 16 and disposed alongside it is the usual cam drum 25 which is also free on the shaft 17 and which, moreover, is arranged to be independently rotated intermittently likewise in a well known manner through picking of ratchet teeth 26 thereon by another pawl not shown. Since the cam drum 25 is not directly concerned with our invention, it need not be further referred to. As usual, the chain 15 carries cam projections or lugs 27 which are spaced transversely of said chain and arranged at suitable intervals lengthwise thereof. In passing about the sprocket drum 16 the cam lugs 27 normally act at different times upon control elements, i. e. fingers 32–36 which are freely mounted for independent pivotal movement on a horizontal rod 37 arranged at a level above the sprocket drum. As shown in Fig. 1 the fingers

32—36 have upward arm extensions for connection, through interposed parts (not illustrated), to the various submechanisms of the knitting machine which they are designed to individually govern. Movement of the fingers 32—36 toward the sprocket chain 15 is limited by engagement of stop projections 38 thereon with a fixed abutment bar 39 extending inwardly from the side frame 19, such engagement being yieldingly maintained by means of individual springs 40 in compression between the stop projections of the individual fingers and said bar as instanced in Fig. 4.

Instead of being fixedly mounted as ordinarily heretofore, the pivot rod 37 for the fingers 32—36 is, in accordance with our invention, secured at its opposite ends in slide blocks 42 and 43 which are engaged in horizontal grooves of fixed guides 44 and 45 (all separately illustrated in perspective in Figs. 10 and 11) respectively secured by screws 46 and 47 to the end frame 19 and to a supplemental bearing bracket 48, see Figs. 1, 2 and 10.

Journalled at its opposite ends in the guides 44 and 45 is a shaft 49 which passes through longitudinal slots 42a and 43a in the slides 42 and 43 and which also receives rotative support in the end frame 19 and in the bracket 48 as clearly shown in Figs. 9 and 10; and affixed to this shaft immediately inward of the guides, are collars 50 and 51 respectively having segmental or radial stop projections 50a, 51a for abutment by inwardly extending projections or lugs 42b and 43b on the slides 42 and 43. Individual helical springs 52 in tension between anchorages on the guides 44 and 45 and the slides 42 and 43 draw outwardly upon the latter to keep the lugs of said slides in engagement with the stop projections 50a and 51a of the collars 50 and 51. At its outer end the shaft 49 is provided with an operating hand crank 53 which is normally held in the position in which it is shown in Figs. 1-3, by the laterally offset projection 54a at the free end of a keeper element in the form of a flexible tongue 54.

Overthrow of the sprocket drum 16 as the ratchet teeth 23 are picked is prevented by a brake shoe 55 on the swinging end of a curved arm or lever 56 which is fulcrumed on a rod 57 whereof the opposite ends are secured in bosses or lugs respectively afforded by the side frame 19 and the supplemental bracket 48. The lever 56 is urged counter-clockwise in Fig. 4 by a spring 58 compressed between it and another fixed abutment bar 59 on the frame 19 so that the brake shoe 55 is normally maintained yieldingly in frictional contact with the sprocket drum 16. In accordance with our invention, the brake lever 56 is arranged to be actuated through a link bar 60 from arm 61 on the manually operable shaft 49 previously referred to, said link bar being clevised at its lower end as best seen in Fig. 1 to loosely straddle the swinging end of said lever behind a terminal head 56a thereon.

For the purpose of resetting the timing chain 15 after stoppages of the knitting machine upon development of irregularities in the knitting, we have provided a separate hand crank 62 (Figs. 1-3) which is freely mounted on the outer end of the drum shaft 17, being held in place on said shaft by a washer 63 and a screw 64 as shown in Fig. 6. To the boss 62a of the hand crank 62 is secured, by means of screws 65, a sprocket pinion 66 which through a chain 67, is connected with another sprocket pinion 68 at the outer end

of the shaft 69 whereto the guide sprocket wheel 20 for the timing chain 15 is affixed.

Having thus described our invention, we claim:

1. In pattern control mechanism for knitting machines, a timing chain; a sprocket drum about which the chain is trained; a group of control elements normally positioned in the paths of cam projections on the chain; a slide on which the control elements are supported for independent movement; a fixed guide on which the slide is restricted to movement toward and away from the chain; spring means tending to retract the slide and thereby bodily withdraw the control elements out of the range of the cam projections on the chain when it is desired to reset the latter to starting position; a shaft with a radial stop projection for engaging the slide to keep it in normal position; and means on said shaft whereby it can be turned to permit retraction of the slide by the spring means.

2. In pattern mechanism for knitting machines, a timing chain; a sprocket drum about which the chain is trained; a group of control elements normally positioned in the paths of actuating cam projections on the chain; a slide on which the control elements are supported for independent movement; a fixed guide on which the slide is restricted to movement toward and away from the chain; spring means tending to retract the slide and thereby bodily withdraw the fingers out of the range of the cam projections on the chain when it is desired to reset the latter to starting position; a shaft with a radial stop projection for engaging the slide to keep it in normal position; a hand crank on the shaft whereby the latter can be turned to permit retraction of the slide by the spring means; and releasable means for holding the hand crank against movement with the slide in active position.

3. In pattern mechanism for knitting machines, a timing chain; an intermittently rotated sprocket drum about which the chain is trained; a brake member to prevent overthrow of the drum incident to impartation of step-wise rotative movements thereto; a group of independently movable control elements normally positioned in the paths of actuating cam projections on the chain; a movable support for the control elements; and means for retracting the support to bodily withdraw said elements out of the range of the cam projections on the chain when it is desired to reset latter to starting position, and for concurrently withdrawing the brake member from the sprocket drum.

4. In pattern mechanism for knitting machines, a timing chain; an intermittently rotated sprocket drum about which the chain is trained; a brake member to prevent overthrow of the drum incident to impartation of step-wise rotative movements thereto; a group of control elements normally positioned in the paths of actuating cam projections on the chain; a slide on which the control elements are supported for independent movement; a fixed guide by which the slide is restricted movement toward and away from the chain; a manually operable shaft with means thereon instrumental in effecting the retraction of the slide for withdrawal of the control elements out of the range of the cam projections on the chain when it is desired to reset the latter to starting position; and a connection operated from said shaft whereby the brake member is withdrawn from the sprocket drum concurrently with the retraction of the slide.

5. In pattern mechanism for knitting ma-

chines, a timing chain; a sprocket drum about which the chain is trained; a group of independently movable control elements normally positioned in the paths of actuating cam projections on the chain; a supporting slide for the control elements and a fixed guide in which the slide is constrained to movement toward and away from the chain; and means for retracting the slide to bodily withdraw said elements out of the range of the chain when it is desired to reset the latter to starting position.

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HOWARD K. WEST.

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