

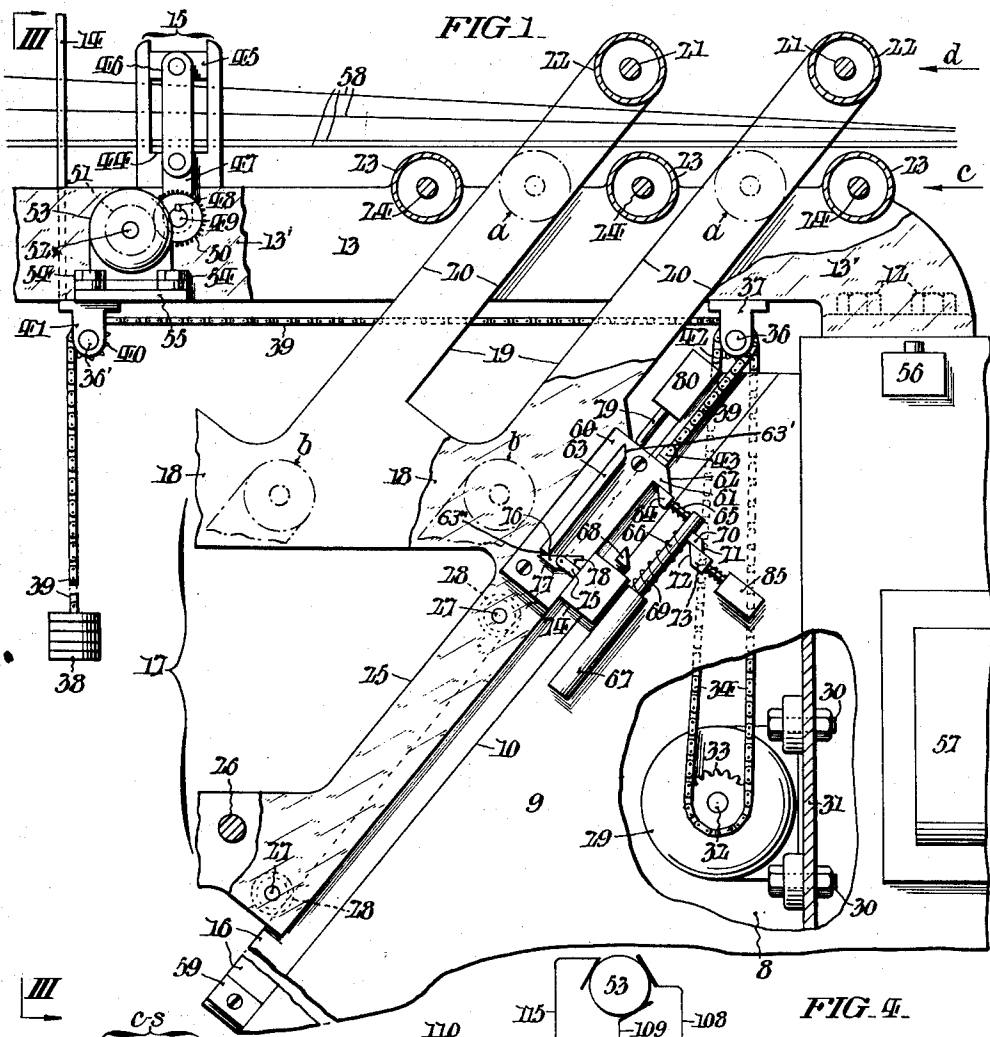
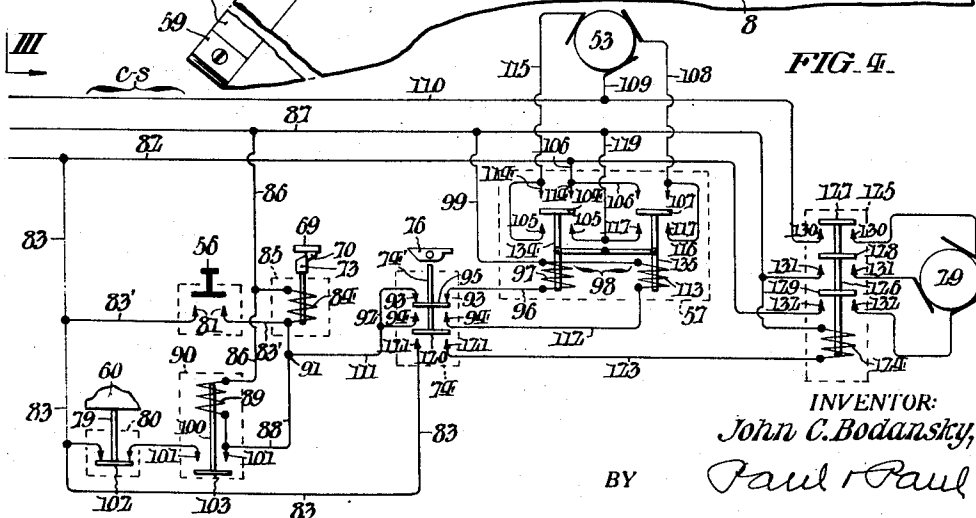
Dec. 19, 1950

J. C. BODANSKY
STOP CONTROL MECHANISM

2,534,896

Filed Aug. 25, 1947

4 Sheets-Sheet 1



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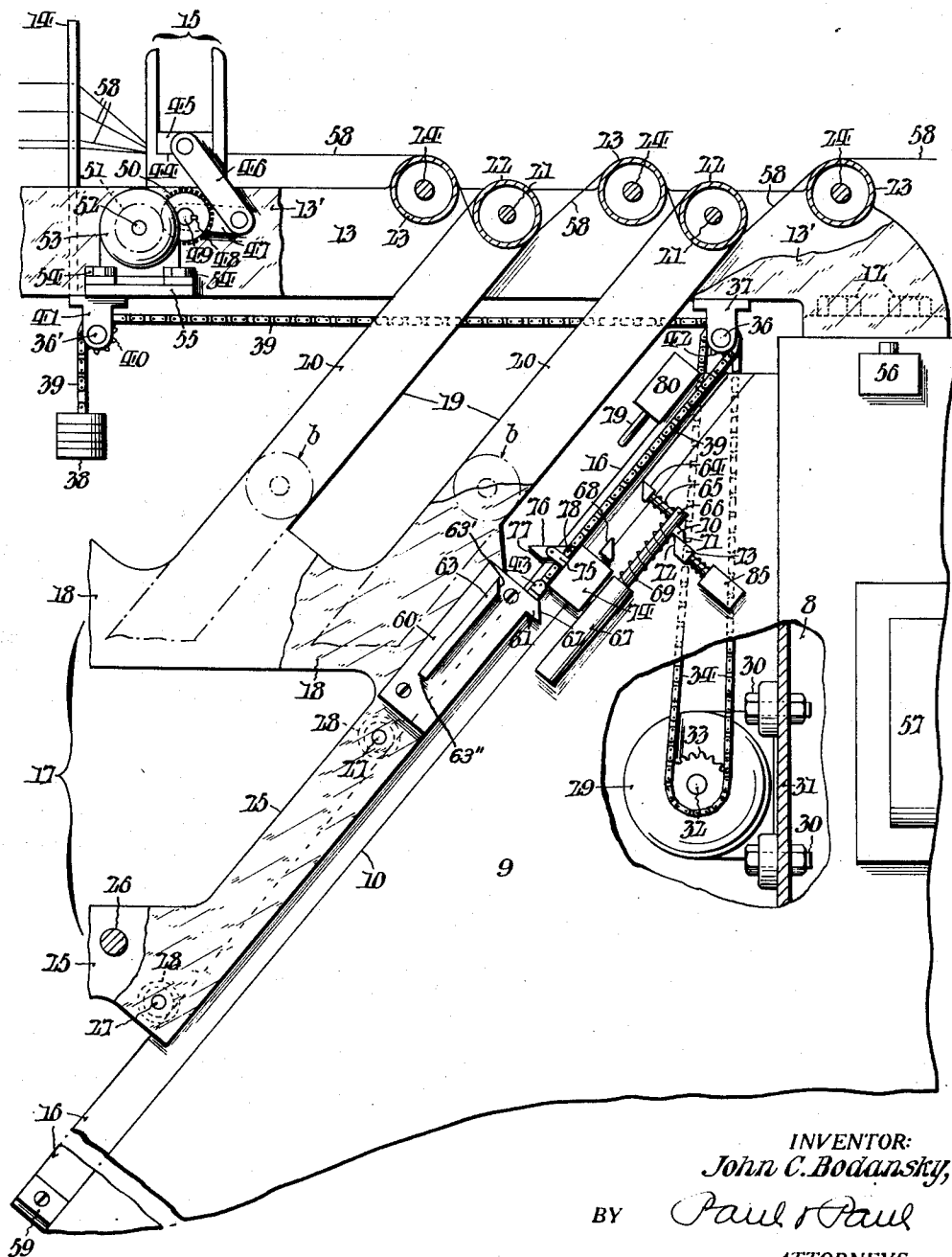
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FIG. 2.



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FIG. 3

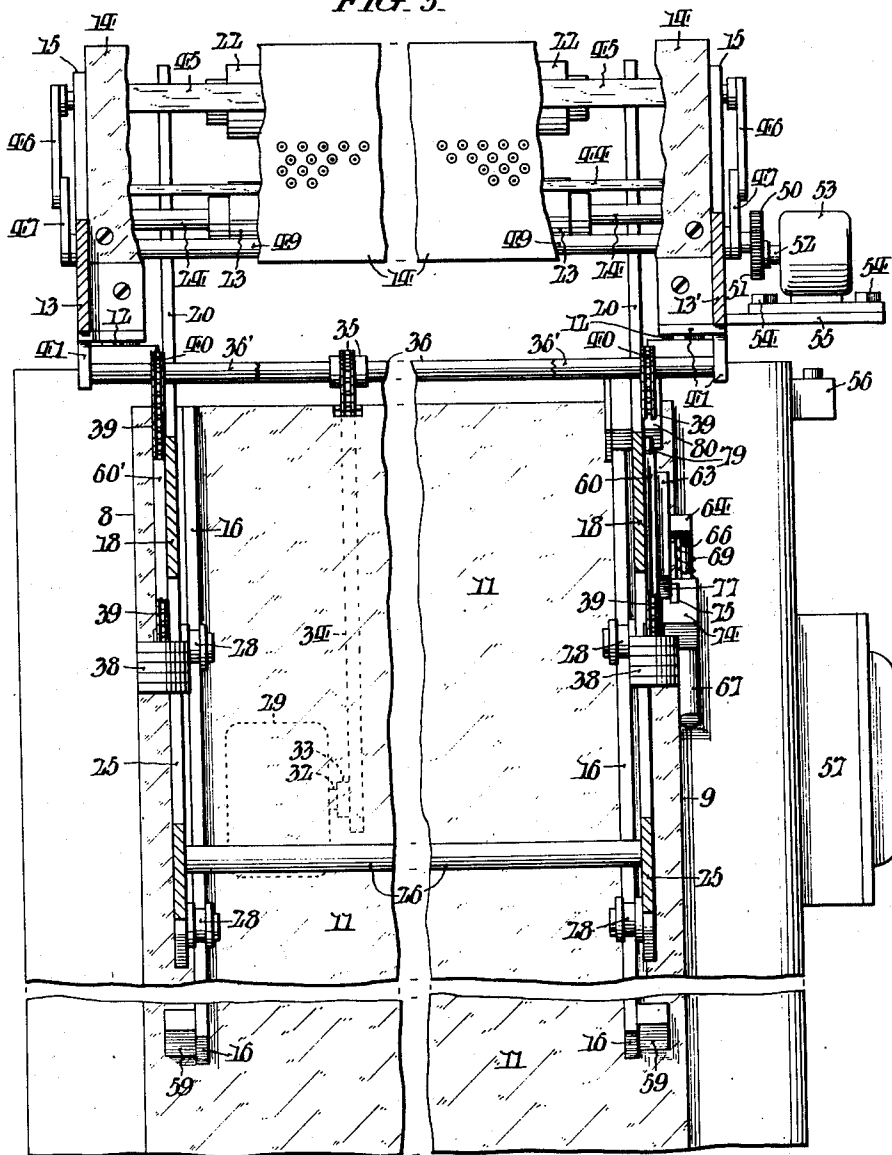
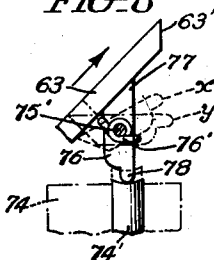


FIG-8



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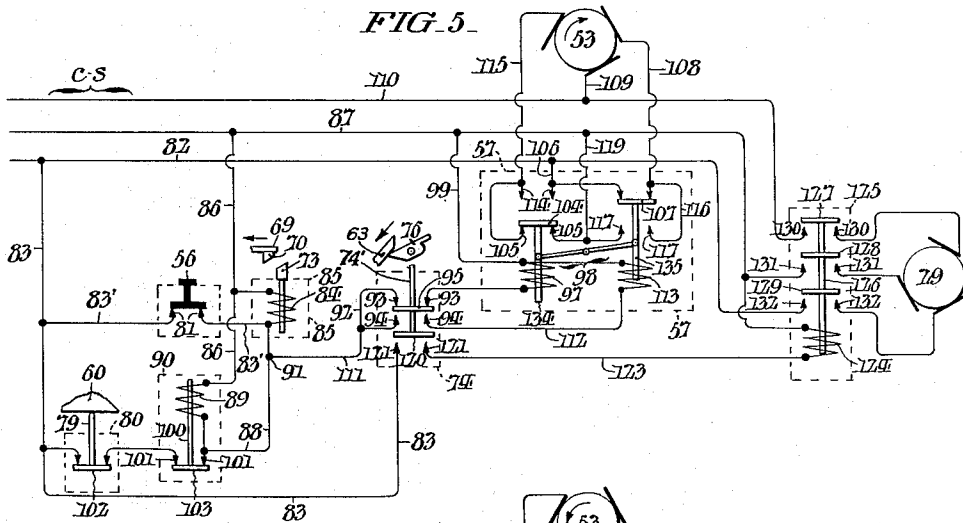
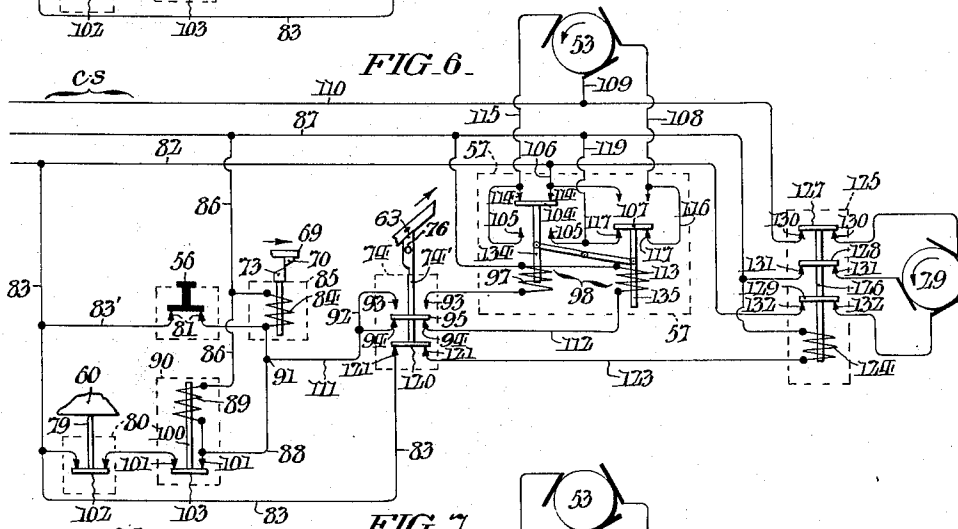
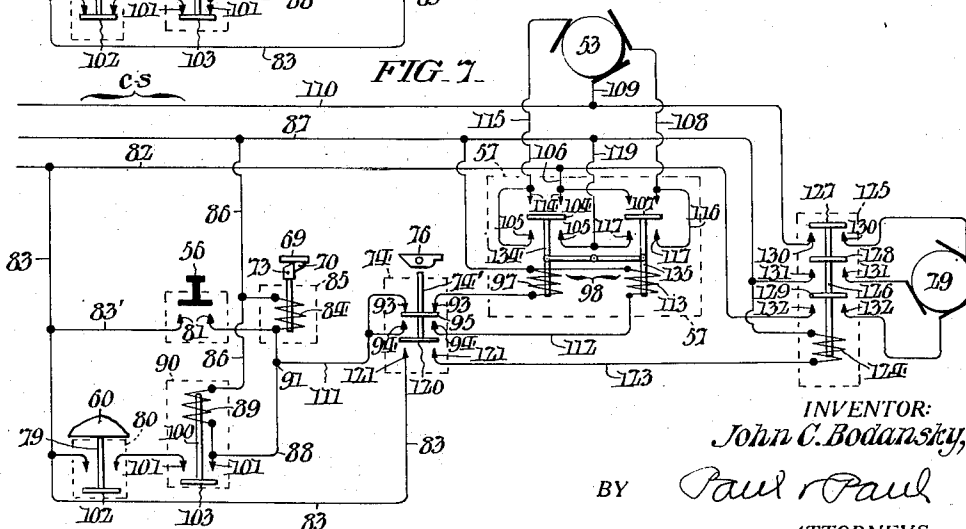
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4 Sheets-Sheet 4



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2,534,896

STOP CONTROL MECHANISM

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Application August 25, 1947, Serial No. 770,491

6 Claims. (Cl. 28—32)

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This invention has general reference to warping apparatus or machines serviceable to wind multiple yarns or threads from a source of supply, or a creel, onto a spool or beam preparatory for subsequent weaving or processing; while it relates more particularly to the type or species of machine or apparatus including an accumulator means for the temporary unwinding of a portion of the yarns or threads, from the spool or beam in order to locate and repair a broken thread or yarn, whenever such a contingency takes place.

More particularly, the instant invention has reference to beam warpers of the kind wherein alternate of the accumulator rolls are sustained by a common support or carrier having capacity for gravitational descent and automatic elevation, such as the species disclosed in my prior application for a patent, filed the 25th day of August, 1947, under Serial No. 770,490, now Patent No. 2,491,438.

Accordingly, the primary object of my invention is to provide a novel form of accumulator device for beam warpers in which the movable carrier sustaining the drop-rolls is arranged for inclined descent in opposition to suitable restraining action and automatic elevation, whereas the drop-rolls are elevated by rewinding of the yarns or threads onto the spool or beam aided by counterbalancing means.

Another object of my invention is to provide an accumulator device of the species defined by the preceding paragraph, which includes novel means whereby the beam warper is automatically stopped whenever a yarn or thread breaks.

A further object of my invention is to provide a novel accumulator device and associated yarn or thread clamping means, both of which are electrically-controlled and automatically-activated as required.

Other objects, with ancillary advantages, will be apparent, or become self-evident, to those skilled in the art upon a full understanding of the construction, arrangement, and operation of the typical means hereinafter disclosed; but it is to be understood that my invention is susceptible of other embodiment, or structurally modified forms, coming equally within the terms and scope of the claims.

In the accompanying drawings—

Fig. 1, Sheet 1, is a broken side elevation of that portion of a typical form of yarn or thread beamer, including the accumulator means and clamping device and embodying the fundamentals of this invention, with parts broken-out or in section for a better disclosure of otherwise hidden features, and also showing the drop-roll carrier at maximum elevation, or in an inoperative position.

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Fig. 2, Sheet 2, is a somewhat similar elevational view to the preceding figure but showing the drop-roll carrier as initially lowered to an intermediate position or beaming location ready for gravitational descent in opposition to the influence of its counterbalancing means whenever a yarn or thread break occurs.

Fig. 3, Sheet 3, is an end elevation taken as indicated by the angled arrows III—III at the left-hand side of Fig. 1.

Fig. 4, Sheet 1, is a diagram of an electrical wiring system suitable for controlling the mechanism illustrated by the three preceding figures or when the drop-roll carrier is in beaming location and about to commence gravitational descent.

Fig. 5, Sheet 4, is a similar wiring diagram depicting the relative position of the electric system when the carrier is at its low level limit of movement.

Fig. 6 is a corresponding diagram showing the electrical system during ascent of the carrier.

Fig. 7 is a diagram showing the relation of the electrically controlled items in the system when the carrier is at maximum elevation, or in the inoperative position; and,

Fig. 8, Sheet 3, is a detail hereinafter fully explained.

In describing the typical form of my invention shown by the accompanying sheets of illustrative drawings, specific terms will be employed for the sake of clarity, but it is to be expressly understood the scope of said invention is not thereby limited; each such term being intended to embrace all reasonable equivalents which perform the same function for an analogous purpose.

Referring more in detail to the drawings, and first to Figs. 1 to 3 inclusive, the reference characters 8, 9, comprehensively designate fragmentary portions of the spaced side frames of a known type of beam-warper, said frames having their forward edges inclined at 10 and being connected together by a front wall 11, Fig. 3. In addition the side walls 8, 9, afford rigid attachment, as by securing means 12, for forwardly-directed extension members 13, 13' that jointly afford rigid support for the eye-board 14, as well as the yarn or thread clamping device 15.

Fixedly mounted on the inclined front wall 11 are spaced track-bars or rails 16, and progressive on said rails 16 is a carriage or carrier 17, including spaced members 18, approximately maintained in parallelism; while it is to be noted said members 18 embody upwardly-directed spaced extensions or arms 20, defining an intermediate gap 19, between the upper ends whereof are journaled on stationary axes 21, the drop-rolls 22. On the other hand the relatively stationary accumulator-rolls 23 are similarly journaled on fixed axes 24, rigidly secured transversely inter-

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mediate the side frame extension-members 13 aforesaid. The spaced members 13 also embody downwardly-directed portions or legs 25 which are maintained in parallelism by a transverse tie or brace 26; while it is to be observed the said legs 25 are equipped with inwardly directed stub axes 27, affording rotatory bearing for grooved wheels 28 coactive with the rails 16 and whereby the drop-roll carrier 17 is movably sustained, as hereinafter fully explained.

At this juncture it is to be noted that the carrier 17 is, preferably, elevated by means of a suitable-motor 29 conveniently although not essentially, attached by securing means 30 to a wall 31 intervening the side frames 8, 9, while the drive-shaft 32 thereof is provided with a sprocket-gear 33 about which is trained an endless chain 34, which similarly coacts with a sprocket clutch 35 on a transverse shaft 36 journaled in drop-bearings 37 made fast to the frame extension members 13, 13' aforesaid. The sprocket clutch 35, it is to be understood, is adapted to drive the shaft 36 in one direction only under action of the chain 34 when the motor 29 is activated to elevate the carrier 17; whereas said sprocket clutch 35 and chain 34 are stationary when the motor 29 is inoperative. It is also to be noted that the carrier 17 is enabled to smoothly gravitate downwards for a portion of its travel by aid of counter-balancing weights 38 pendent from the relatively outer ends of suitable chains 39. These chains 39 are trained over gears 40 fast on and freely rotative with a shaft 36' journaled in drop-bearings 41, and over similar gears 42 fast on the transverse shaft 36; while said chains 39 have their inner ends attached at 43 to the carrier 17.

Referring to the clamping-device 15, the same is of the type disclosed in another application filed by me on the 25th day of August, 1947, under Serial No. 770,492, now Patent No. 2,491,439; that is to say, said device includes an anvil 44 and a relatively movable clamping bar 45, the latter being raised relative to said anvil by toggle-levers 46, 47 at each side of the warper. The one or right hand lever 47, in Fig. 3, is conjointly made fast with an associated gear 50, as by a key 48, to a transverse-shaft 49 appropriately journaled through the side-frame extension members 13, 13'; while said gear 50 is in direct mesh with a complementary gear 51 attached on the drive-shaft 52 of a torque or other suitable electric motor 53, stationarily secured by attaching means 54 to a bearing bracket 55 conveniently projecting laterally from the adjoining extension member 13' aforesaid.

56 is a push button, and 57 a switch-box, both of which are hereinafter referred to in connection with the electric control system, which forms an important feature of the instant improvement; while 58 are the yarns or threads, and 59 are downward movement-limiting stops for the carrier 17, as later on explained.

In order to hold the carrier 17 normally elevated or during the actual beaming operation, I conveniently attach to one of its side members 18 a trip device preferably in the form of a flat rectangular element 60 embodying a planarly-related corner tooth 61 having a taper end 62, and a laterally-directed projection or rib 63; said tooth 61 being adapted to seat on the upper face of a movable stop 64 under the projective influence of a spring 65. The stop 64 is mounted at the outer end portion of a pressure-influenced piston or the movable component 66 of a pneu-

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matic-device 67, for example, made fast to the adjoining beamer side-frame 9; while said stop 64 is depressible by a coactive trip lug 68 also secured to, or mounted on, the frame 9.

The pneumatic device component 66 is outwardly influenced by an encircling spring 69, while said component 66 also includes a holder-tooth or lug 70 having a taper-edge 71 for coaction with the complementary face 72 of a spring-influenced solenoid-actuable stop 73. In addition to all of the foregoing, there is also rigidly secured to the side frame 9 a switch 74 having a projecting lug 75 including a bearing pin 75' proximate its outer end, for a pivotal trigger 76. The trigger 76 embodies a taper end 77 and an oppositely-related tooth 78, which does not coact with or depress the switch plunger 74' during downward movement of the carrier lateral rib 63; while 79 designates the movable element of a trip switch 80, that is only acted on incidental to elevation of the carrier 17 to the maximum elevation of Fig. 1; and all of which are later on hereinafter further referred to.

Having outlined the various structural items involved in my improved stop control mechanism for beam warpers, I will now describe the related actuation thereof with reference, more particularly, to the electrical diagrams shown by Figs. 4 to 7 inclusive. It is firstly to be noted that the current supply lines are comprehensively designated c, s, while the carrier 17 is in its uppermost position ready for normal beaming of the yarns or threads 58, that is to say with the drop-rolls 22 in parallelism with respect to the accumulator rolls 23 and the clamping-device 15 inactive or open, as shown in Fig. 1. It will be readily understood that when the normal beaming operation is interrupted, such as whenever a yarn or thread 58 breaks that the machine will stop, in accordance with known procedure, whereupon the operator depresses the push-button switch 56 to bridge the associated contacts 81 which closes a circuit from the lower current conductor 82 across said contacts 81 through lines 83, 83' to coils 84 of switch 85 controlling the holder stop 73 and thereby retracts the latter, with return by way of line 86 to the middle current conductor 87. Retraction of the holder stop 73 releases the carrier 17 bearing the drop-rolls 22, for slow gravitational progression down the track rails 16 under the joint influence of the counter-weights 38 and the movement restraining action of the pneumatic device 67, which latter device tends to retard or hold-back said carrier 17 by means of the movable spring loaded stop or catch 64 sustained by the component 66 of said device 67.

When the operator depresses the push-button switch 56 the following additional circuits are also completed, one circuit from the line 83' of switch 85 by line 88 to one end of the coil 89 of an auxiliary-switch 90, conveniently located in the box 57 hereinbefore mentioned, through said switch and by return line 86 to middle conductor 87. The other circuit first above referred is established as follows from the switch 85 to contact 91, in line 88, and branch line 92 to the top contacts 93 of the normally-closed double-pole switch 74 by aid of the upper blade 95 thereof and, by line 96, Fig. 4 to the left-hand coil 97 of a reversing switch 98—likewise in box 57—and line 99 to middle conductor 87. When the circuit through the auxiliary switch 90 is completed, energizing of its coil 89 retracts the associated core 100 with resultant bridging of the contacts 101, whereby

a further or sub-circuit is closed from the current conductor 82, line 83, across the blade 102, of the normally-closed trip switch 80, and blade 103 of the now closed auxiliary switch 90, through the coil 89 of the latter switch and line 86 to the middle current conductor 87 of the current supply c, s. This last mentioned sub-circuit enables establishment of another circuit from the bottom supply conductor 82 through the switches 80, 90 and 74, and through the left-hand coil 97 of the reversing switch 98 to the middle conductor 87 of the current supply c, s, inasmuch as the switches 80 and 90 by-pass the push-button switch 56; the just mentioned circuit being maintained even when the operator releases the switch 56.

When the circuit through the left-hand coil 97 of the reversing switch 98 is established, it is to be observed that the blade 104 of said switch, by bridging the lower contacts 105, Fig. 5, closes a further circuit as follows from the feed in conductor 82 by branch line 106, across the now elevated right-hand switch blade 107 and line 108 to the yarn or thread clamping-device operating-motor 53, thence through said motor with return by line 109 to upper current supply line 110, see Fig. 5. Operation of the motor 53 will, obviously, effect collapse of the toggle-levers 46, 47 and thereby lower the clamping-bar 45 into active gripping engagement on the lay of yarns or threads 58 against the anvil 44, see Fig. 2.

Incidental to initial release of the carrier 17, from being held up at its uppermost level, as shown in Fig. 1, by the holder-stop 73, said carrier will descend a predetermined distance or until the drop rolls 22 contact the lay of yarns or threads 58 at approximately the level designated by the broken line circles *a* in Fig. 1 where they are temporarily restrained incidental to coaction of the parts 64, 61 aided by support afforded by the lay of yarns or threads 58 and the retardative action of the pneumatic device 67. However, when the carrier 17 is freed by impact of the spring-loaded stop 64, against the stationary trip-lug 68, said stop 64 will be forced away from contact below the carrier-borne corner-tooth 61. Movement of the stop 64 as just stated releases the movable component 66 of the stationary pneumatic device 67 for projection above the carrier corner tooth 61 under the action of the associated spring 69, in an obvious manner; whereupon the carrier 17 is freed for gravitational descent down the inclined track rails 16 to its low level of movement, or into engagement with the limit stops 59, with the drop-rolls 22 in the position designated by the broken line circles *b* in Figs. 1 and 2. Incidental to gravitation of the carrier 17 under the restraining influence of the counter-balancing weights 38, it will be readily understood that the lay of yarns or threads 58 will be smoothly and evenly drawn from off the winding beam, not shown, until the limit stops 59 are impacted by the carrier 17, with concurrent formation of loops by the drop-rolls 22 for ready detection and repair of a broken yarn or thread 58, in accordance with prevailing practice.

After the broken yarn or thread 58 has been repaired and the warper re-started the lay of yarns or threads 58 will draw-up the carrier borne drop-rolls 22 aided by the now descending counter-weights 38 until said drop rolls 22 are approaching the level designated *c* in Fig. 1, whereupon the trip-device lateral rib 63 engages and rocks the pivotal trigger 76 clockwise to thereby depress the stem 74' of the switch 74,

see Figs. 6 and 8, which causes the upper blade 95 of said switch 74 to move and break the circuit across the contacts 93 to and through the lefthand coil 97 of the reversing switch 98, and establish another circuit from the feed-in conductor 82 by way of line 83, blade 102 of trip-switch 80 to blade 103 of auxiliary switch 90, line 88 and branch 111 to and across middle contacts 94 of double-pole switch 74, and thence by line 112 to right-hand coil 113 of the reversing-switch 98, with resultant transfer of left-hand switch blade 104 from the contacts 105 to the super-spaced contacts 114, see Fig. 6, whereby a circuit is established as follows from the current conductor 82 by way of branch 106 across contacts 114 and line 115 to motor 53, thence by way of line 109 to current conductor 110. At the same time another circuit is closed by aid of switch blade 107 engaging contacts 117 from conductor 87, line 119 across contacts 117 and lines 116, 108 to motor 53 with return by line 109 to conductor 110, whereby said motor 53 is reversed to effect expansion of the toggle-levers 46, 47 with resultant elevation of the clamp-bar 45 from grippage on the lay of yarns 58 on the anvil 44. Simultaneously with the reversal of the motor 53 the bottom blade 120 of the double-pole switch 74 effects closure of a circuit as follows, from the current supply conductor 82 by way of line 83 to and across the lower contacts 121 of the double-pole double-throw switch 74 by aid of bottom blade 120 and on by-line 123 to the coil 124 of triple-pole single-throw switch 125, also in the box 57 hereinbefore referred to, that controls operation of the carrier elevating motor 29.

It is to be particularly noted at this juncture, and as better understood from Fig. 8, that as the carrier 17 is elevated, the trigger 76 will be rocked clockwise by the taper end 63' of the carrier rib 63, see *x* in said figure, until it passes from below the end 63'', Figs. 1 and 2, of said rib whereupon it automatically swings into the position of Fig. 7, or that designated *y* in Fig. 8, under the influence of an associated recoil spring 76'. The switch 74 is not affected, or operated, during the downward travel or movement of the trip-device lateral rib 63 on the carrier 17, as readily appreciable on an examination of the drawings; or, in other words, by counter-clockwise rocking of the trigger 76, as indicated by the dotted showing *x* in Fig. 8, during the first portion of descent of the carrier 17, such trigger simply rides freely under the rib 63 without any depressive influence being exerted on the plunger 74' of the switch 74.

Energizing of the coil 124 will, obviously, shift the movable component 126 from the open position of Figs. 4, 5 and 7, to the closed position of Fig. 6; or, with its blades 127, 128 and 129, engaging the respectively associated contacts 130, 131 and 132, and, as a result, the carrier raising-motor 29 is caused to automatically assume elevation, by aid of the parts 32, 33, 34, 35, 36, 36' and 39, of the carrier 17, until said carrier attains the inoperative position designated by the arrow *d* at the right-hand of Fig. 1, or with the drop-rolls 22 clear above the yarns or threads 58.

Now it is to be particularly remarked that as the carrier 17 approaches the high position *d* just previously explained it encounters the element 79 of the trip-switch 80 which is moved to break the circuit through the coil 89 of the auxiliary-switch 90 and thereby open said switch 80, with simultaneous interruption of the circuit through the switch 85 that controls the solenoid-actuable

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holder catch 73, and thus permits said catch to fly back into arrestive position below the carrier corner tooth 61. At the same time the circuit through the right-hand coil 113 of the reversing switch 98 is broken and thereby permits the movable components 134, 135 thereof to return to the neutral position of Figs. 4 and 7 with resultant de-energizing of the clamping-motor 53, in an obvious manner.

Particular attention is also directed, at this juncture, to the fact that as the carrier 17 travels upward by aid of the motor 29, the trip-device lateral rib 63 encounters and rocks the pivoted trigger 76 over clockwise which, as said parts 63 and 76 become later disengaged, permits the trigger 76 of the double-throw switch 74 to return to its normal position of Figs. 4 and 7, which breaks the circuit across the bottom contacts 121 of said switch to and through the coil 124 of the carrier raising motor 29, whereby the latter is stopped. As a result, the carrier 17 now descends by gravity until engaged by the spring-loaded movable stop 64 which is projected into and below the corner tooth 61 of the trip-device 60 under the influence of the associated spring 65, whereupon said carrier is positively arrested and held stationary by the holder stop 73, in an obvious manner; when the beam warper is again in position ready to resume beaming.

From the foregoing description and an examination of the drawings it will be readily understood that by my present invention I have provided a simple and efficient stop-control mechanism for beam warpers or analogous machines which greatly increases the efficiency thereof, with an obvious reduction in overhead operating costs. It is furthermore, felt that from the foregoing disclosure, the merits and advantages of my improvements will be clearly appreciated by those conversant with the related arts. Accordingly, while there has been shown and described one practical embodiment of my invention, it is to be understood that changes and variations in adapting said inventions to different types of beam warpers are hereby contemplated, and which may be fairly included within the terms and scope of the following claims.

Having thus described my invention, I claim:

1. In a beam warper of the type having a warp control means between a source of warp supply and a selectively driven warp beam, said warp control means comprising a first set of rolls having fixed axes, a second set of rolls, a carrier for said second set of rolls, said carrier being mounted for movement between an upper position in which warp passing between the two sets of rolls is untensioned thereby and a lower position in which the warp is drawn into loops of substantial length and the movement from the upper to the lower position being solely caused by gravity, said carrier being normally releasably held in said upper position, means for releasing said carrier, means for checking the first portion only of the downward movement of the carrier, means for releasing said checking means whereby said carrier completes its downward movement unrestrained thereby, said carrier being thereafter raised to an intermediate position by the pull of the warp thereon, and power means for raising said carrier from only said intermediate position to said upper position.

2. In a beam warper of the type having a warp control means between a source of warp supply

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and a selectively driven warp beam, said warp control means comprising a first set of rolls having fixed axes, a second set of rolls, a carrier for said second set of rolls, said carrier being mounted for movement between an upper position in which warp passing between the two sets of rolls is untensioned thereby and a lower position in which the warp is drawn into loops of substantial length, and the movement from the upper to the lower position involving a gravity descent of the carrier, said carrier being normally releasably held in said upper position, means for releasing the carrier for initial descent to an intermediate position followed by gravity descent to the lower position, and means whereby said carrier may thereafter be automatically elevated to said intermediate position by the pull of the warp thereon.

3. In a beam warper having a warp control means between a source of warp supply and a selectively driven warp beam, said warp control means comprising a first set of rolls having fixed axes, a second set of rolls, a carrier for said second set of rolls, said carrier being mounted for movement between an upper position in which warp passing between the two sets of rolls is untensioned thereby and a lower position in which the warp is drawn onto loops of substantial length, and the movement from the upper to the lower position involving a gravity descent of the carrier, said carrier being normally releasably held in said upper position, means for releasing the carrier for initial descent to an intermediate position followed by gravity descent to the lower position, means for cushioning and counter-balancing the gravity descent of the carrier, and means whereby said carrier may thereafter be automatically elevated to the vicinity of said intermediate position by the pull of the warp thereon.

4. In a beam warper, as defined in claim 2, an inclined track engaged by said carrier and guiding the same in its descent and elevation.

5. In a beam warper, as defined in claim 2, wherein the carrier for the movable set of rolls consists of spaced side members having roller elements thereon and having upwardly-directed spaced arms on which the movable rolls are mounted for free rotation, an inclined track engaged by the roller elements of said side members and guiding the carrier in its descent and elevation.

6. In a beam warper, as defined in claim 2, pressure-influenced means effective to hold the carrier at maximum elevation and to hold said carrier stationary during the normal beaming operation, and when released freeing the carrier for gravitational descent, additional pressure-influenced means engaged with the carrier for cushioned restraint of said carrier during a portion of such gravitational descent; and means effective on release of the last mentioned means to counter-balance the farther gravitational descent of said carrier to its lowermost position.

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The following references are of record in the file of this patent:

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