

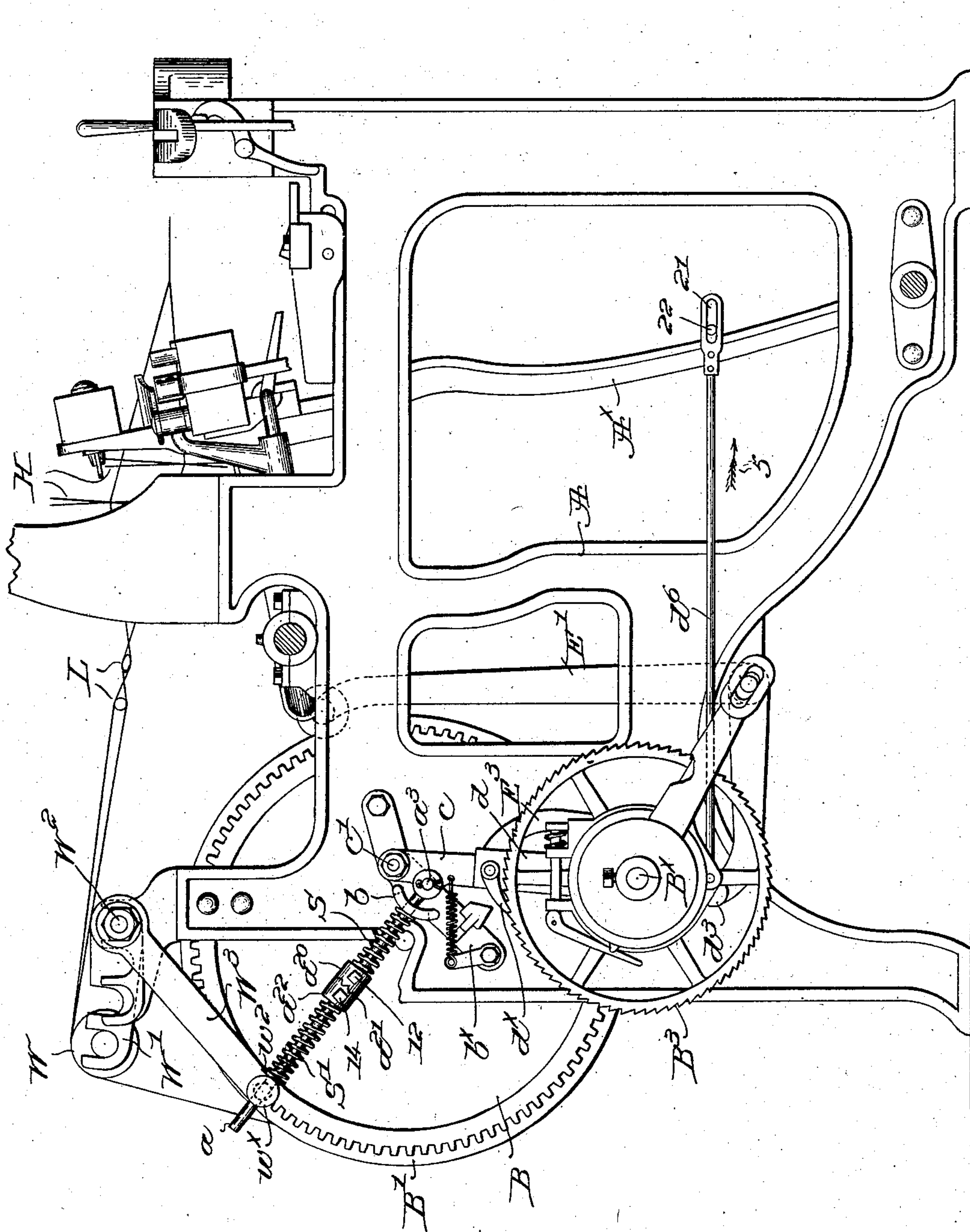
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W. HAYNES.
LET-OFF MECHANISM FOR LOOMS.

APPLICATION FILED JUNE 22, 1903.

NO MODEL.



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LET-OFF MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 741,661, dated October 20, 1903.

Application filed June 22, 1903. Serial No. 162,656. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM HAYNES, a citizen of the United States, and a resident of Atlanta, county of Fulton, State of Georgia, have invented an Improvement in Let-Off Mechanism for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates more particularly to let-off mechanism for looms; and it has for its object the production of simple mechanism comprising few parts to take up or compensate for unevenness in the tension of the warp and to control the let-off in accordance with material or excessive variations of warp tension.

In United States Patent No. 381,617 the whip roll or bar is so mounted that it is movable toward and from the breast-beam, springs being provided to move it rearwardly against the tension of the warp, the spring yielding when the warp tension increases and expanding to take up slackness when the warp tension decreases. By this device a very even or uniform tension on the warp is maintained during the weaving operation, and in my present invention I have with a simplification of construction and reduction of parts embodied all the advantageous features of the described apparatus in connection with the so-called "Roper" let-off, such as is shown in United States Patent No. 647,815, dated April 17, 1900. In such form of let-off the effective stroke of the pawl which causes the positive rotation of the warp-beam is controlled by the warp tension and by the diameter of the yarn mass on the beam; but the slight variations in the warp tension which occur during weaving are not completely provided for.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

The drawing represents in left-hand side elevation a sufficient portion of a loom to be understood with one form of my invention embodied therein.

The loom-frame A, warp-beam B, having an attached gear B', the whip-roll W, mounted in rocking arms W', secured to a rock-shaft W², mounted on the frame, the rocker-arm W³, fast on said rock-shaft, harnesses H, and lease-rods L may be of well-known or usual construction.

A rocking stud w^x , pivotally mounted on the free end of arm W³, has extended loosely through it a rod or link a , which passes loosely through a slotted abutment b on a bracket b^x , secured to the loom side, and, as in Patent No. 647,815, the end of the rod extended through the abutment is pivotally connected at a^3 with the member c of the compound pawl-carrier fulcrumed at c' on the bracket b^x , said member c being herein shown as having an offset for the stud a^3 . The other member d of the pawl-carrier, loosely mounted on the shaft B^x, having fast on it a pinion (not shown) in mesh with the beam-gear B', the let-off pawl d^x , mounted on the member d , and the let-off ratchet B³, with which it cooperates, may be and are all substantially as in the patent just referred to. So, too, the radius-bar E³, which carries the stud or connection (not shown) between the members c and d of the pawl-carrier, and the connected upturned arm E', which governs the position of said connection in accordance with the diameter of the yarn mass on the beam B, are substantially as in said patent and operate as therein described. Herein one end of a link d^6 is connected by a slot-and-pin connection 21 22 with the lay-sword A^x, the other end of the link being pivotally connected with a depending arm d^3 , secured to the hub of the member d of the pawl-carrier, precisely as shown and described in said Patent No. 647,815, each forward beat of the lay moving said link in the direction of the arrow 5, imparting the feed-stroke to the pawl d^x , the stroke always terminating at the same point. The starting-point of the stroke of the pawl, however, is variable, and it is governed by the diameter of the yarn mass on the beam, as in said patent, and also by the tension of the warp, as will be described.

A spring S is coiled around the link a between the fixed ear or abutment b and a col-

lar or abutment a^{20} , adjustably secured to the link by a set-screw 12, the upper end of the collar being toothed, as at a^{21} . A second spring S' is coiled around the link between a sliding collar w^2 on said link and a fixed collar or abutment a^{22} , secured by a set-screw 14, the end of the collar being toothed, as shown, to engage the toothed end a^{21} of collar a^{20} , the expansion of spring S' keeping the sliding collar against the rocking stud w^x . As shown, the toothed ends of the collars are inclined or beveled, and when said collars are arranged so that their two toothed ends are parallel said ends will engage throughout their entire extent. If one of said collars is turned, however, relatively to its fellow, the beveled ends thereof will be moved out of parallelism, separating the collars more or less just as if their opposed ends were untoothed. By making said ends toothed, however, a collar is held from turning while its set-screw is being tightened, it being manifest that to adjust either collar its set-screw must first be loosened. The springs are arranged in tandem and act successively and cumulatively, as will appear more clearly hereinafter, the spring S' taking the place of and fulfilling the functions of the two springs e in the Durkin patent, No. 381,617, while the spring S corresponds in function to the spring correspondingly lettered in Patent No. 647,815. The swinging movement of the rocker-arm W^3 is due to variations in warp tension, and such movement is communicated to the member c of the pawl-carrier through both springs. In other words, the spring S' must be compressed to a predetermined degree before the link a will be moved longitudinally, and up to such point of compression the said spring serves to take up or compensate for any unevenness in the tension of the warp. Thus the spring S' operates to maintain the general warp tension substantially uniform during the weaving operation. If, however, the tension of the warp becomes excessive, the spring S' will be compressed beyond the predetermined degree referred to, and thereupon the spring S will be compressed, the link a being moved longitudinally at such time, and the member c of the pawl-carrier will be moved to set the pawl d^x , as in Patent No. 647,815, and govern the let-off accordingly. After this is accomplished the spring S expands to normal condition, and the additional spring S' either remains compressed or it expands to raise the whip-roll in accordance with the tightness or slackness of the warp. By loosening the set-screw of and adjusting either collar a^{20} or a^{22} while the set-screw of the other collar remains tight either spring can be adjusted as to its tension independently of the other spring, and when the collars are juxtaposed, as shown in the drawing, their toothed ends lock them together, it being manifest that so long as their toothed ends engage at all turning of either collar will be prevented when its set-screw is

loosened and the set-screw of the other collar is tight.

From the foregoing description, taken in connection with the drawing, it will be seen that all the advantageous features of both of the patents referred to are combined in the present apparatus merely by making the sliding connection between the link a and stud w^x and by the additional spring S' and the collars interposed between it and the regular spring S .

The construction is simple, effective, easily and quickly adjusted, and comprises few parts.

The collars between the springs act as an abutment for the spring S' , and I prefer to employ two collars in order that the tension of the springs may be readily adjusted independently of each other.

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

1. In let-off mechanism for looms, a warp-beam, a ratchet, a cooperating pawl, connections between the ratchet and the beam, to rotate the latter and let off the yarn, a rocking whip-roll, and a connection between it and the pawl, said connection including two springs adapted to act successively, one of said springs taking up unevenness in the tension of the warp and the other spring causing an increase in the stroke of the pawl when the warp tension is excessive.

2. In let-off mechanism for looms, a warp-beam, a ratchet, a cooperating pawl, connections between the ratchet and the beam, to rotate the latter and let off the yarn, a rocking whip-roll, and a connection between it and the pawl, said connection including two springs arranged in tandem and adapted to act successively, one of said springs taking up unevenness in the tension of the warp and the other spring causing an increase in the stroke of the pawl when the warp tension exceeds a predetermined resistance of the first-mentioned spring.

3. In let-off mechanism for looms, a warp-beam, a ratchet, a cooperating pawl, connections between the ratchet and the beam, to rotate the latter and let off the yarn, a rocking whip-roll, and a connection between it and the pawl, said connection including two springs arranged in tandem and adapted to act successively, one of said springs taking up unevenness in the tension of the warp and the other spring causing an increase in the stroke of the pawl when the warp tension exceeds a predetermined resistance of the first-mentioned spring, and means to adjust the tension of either spring independently of the other.

4. In let-off mechanism for looms, a warp-beam, a ratchet, a cooperating pawl, connections between the ratchet and the beam, to rotate the latter and let off the yarn, a pawl-carrier, a whip-roll, a rocking support there-

for having an attached arm, a link slidably
 connected with the arm and pivoted to the
 pawl-carrier, a fixed abutment through which
 the link passes loosely, two springs arranged
 5 in tandem on the link between the arm and
 said abutment, and an abutment fast on the
 link between the springs, one of the latter
 acting to take up unevenness in the warp
 tension and the other spring changing the ef-
 10 fective stroke of the let-off pawl when the
 warp tension exceeds a predetermined resist-
 ance of the first-mentioned spring.

5. In let-off mechanism for looms, a warp-
 beam, a ratchet, a cooperating pawl, connec-
 15 tions between the ratchet and the beam, to
 rotate the latter and let off the yarn, a rock-
 ing whip-roll, and a connection between it
 and the pawl, said connection including a lon-
 gitudinally-movable link, a fixed abutment
 20 through which it passes loosely, two collars
 adjustably secured to the link, a spring be-
 tween the fixed abutment and one of the col-
 lars, to govern the stroke of the pawl when
 the warp tension becomes excessive, a second
 25 spring interposed between the other of said
 collars and an arm rocking with the whip-
 roll, and said arm, the second spring taking
 up lesser variations in warp tension and trans-

mitting rocking movement of the arm to the
 first-mentioned spring when such movement 30
 is abnormal.

6. In let-off mechanism for looms, a warp-
 beam, a ratchet, a cooperating pawl, connec-
 tions between the ratchet and the beam, to
 rotate the latter and let off the yarn, a pawl- 35
 carrier, a whip-roll, a rocking support there-
 for having an attached arm, a link slidably
 connected with the arm and pivoted to the
 pawl-carrier, a fixed abutment through which
 the link passes loosely, two springs arranged 40
 in tandem on the link between the arm and
 said abutment, and two collars independently
 adjustable on the link between the adjacent
 ends of the springs, one of the latter acting
 to take up unevenness in the warp tension 45
 and when compressed beyond a predeter-
 mined point acting through the other spring
 to increase the effective stroke of the let-off
 pawl.

In testimony whereof I have signed my 50
 name to this specification in the presence of
 two subscribing witnesses.

WILLIAM HAYNES.

Witnesses:

W. A. CROSLAND,
 EDWARD L. MEYER.