No. 648,143. Patented Apr. 24, 1900.

G. BROWN & E. DICK.

MECHANISM FOR WINDING YARN.

(Application filed Mar. 23, 1899.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1.

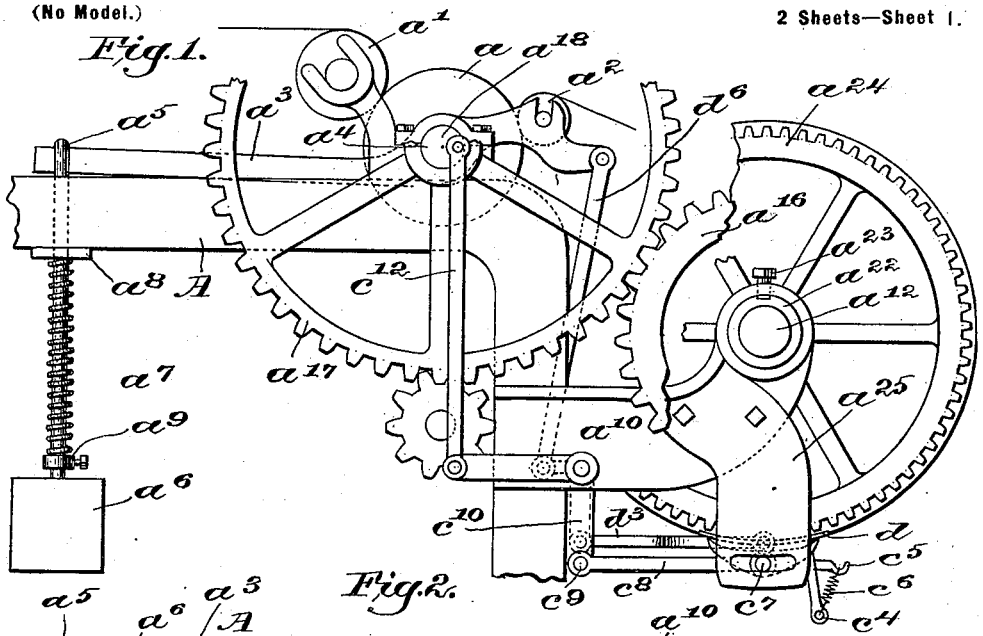

Fig. 2.

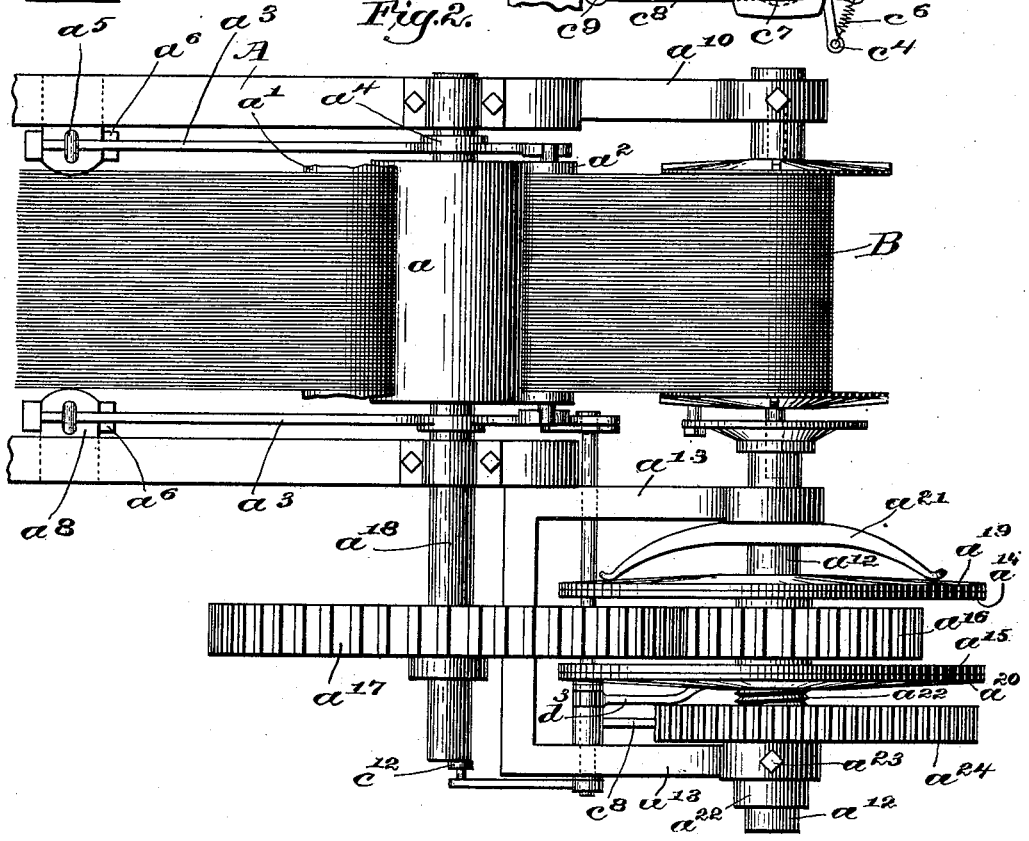

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Fig. 3.

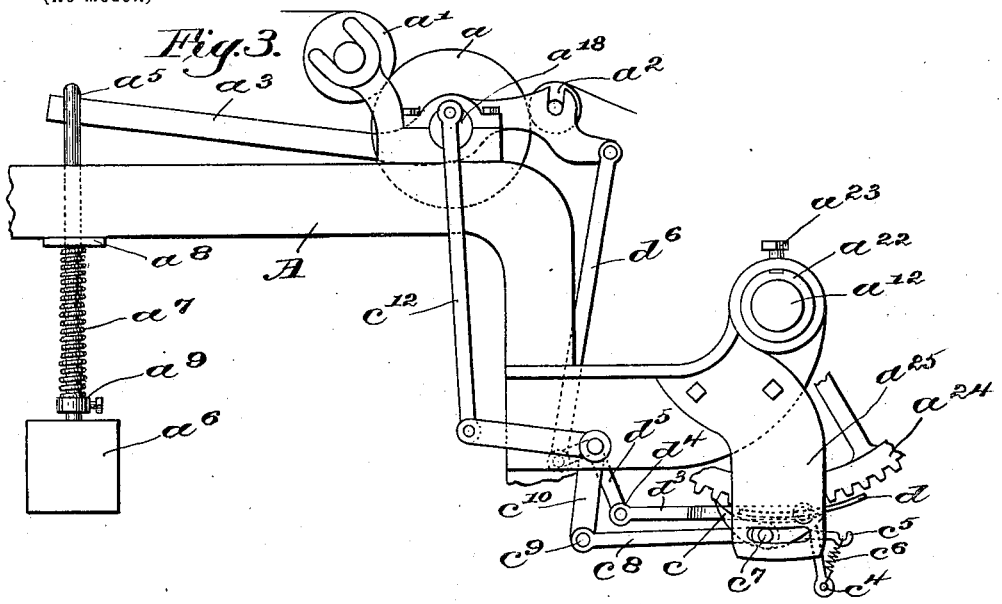


Fig. 4.

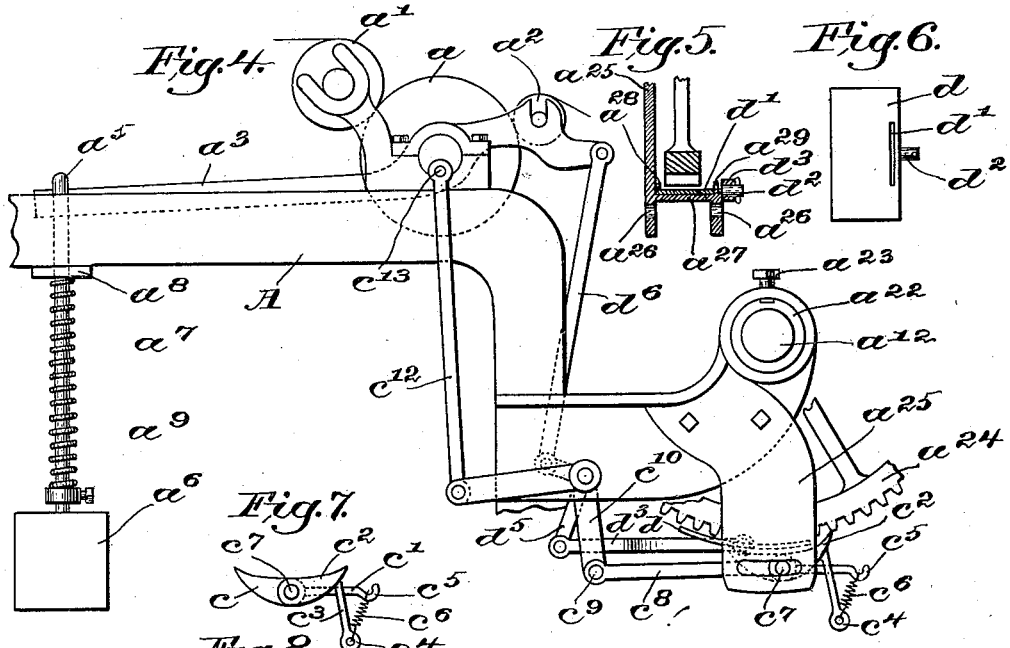
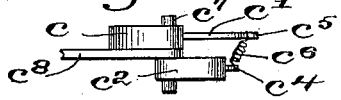


Fig. 5.

Fig. 6.

Fig. 7.

Fig. 8.



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UNITED STATES PATENT OFFICE.

GEORGE BROWN AND EMIL DICK, OF AUBURN, MAINE.

MECHANISM FOR WINDING YARN.

SPECIFICATION forming part of Letters Patent No. 648,143, dated April 24, 1900.

Application filed March 23, 1899. Serial No. 710,137. (No model.)

To all whom it may concern:

Be it known that we, GEORGE BROWN and EMIL DICK, of Auburn, county of Androscoggin, State of Maine, have invented an Improvement in Mechanism for Winding Yarn, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

Our invention is an improved mechanism for controlling the tension of yarn during the process of winding or beaming of the general kind explained in United States Patent No. 613,004, issued to us October 25, 1898.

The present invention relates particularly to the tension-governing mechanism for slashers and beaming-machines, our object being to provide a simple and durable construction which shall be sensitive and automatic in operation; and to that end we have provided, in connection with a suitable clutch mechanism for positively rotating the beam on which the yarn is being wound, a regulator which automatically determines the time and extent of movement of the clutch or coupling mechanism.

The various details of construction and mode of operation and advantages of our invention will be more fully set forth in the following description, reference being had to the accompanying drawings, illustrative of a preferred embodiment of the invention, and the latter will be more particularly defined in the appended claims.

In the drawings, Figure 1 shows in side elevation, parts being broken away, sufficient details of our improvement to enable the same to be understood. Fig. 2 is a top plan view thereof, likewise broken away. Figs. 3 and 4 are fragmentary views in side elevation, illustrating different relative positions of the parts of the mechanism. Fig. 5 is a central vertical sectional detail of the dog-regulator or movable shield. Fig. 6 is a top plan view of said shield. Figs. 7 and 8 show, respectively, the actuating-dogs in side elevation and top plan.

Suitably journaled in the frame A of the machine are fixed rolls $a\,a'$ and a movable roll a^2, the latter being carried concentric to roll a by any convenient yielding mechanism or tension device, herein shown as comprising opposite levers a^3, pivoted at a^4 on the arbor of roll a and carrying at their rear ends bolts or arms a^5, on the lower ends of which are weights a^6, and above the weights are springs a^7, bearing at their upper ends against guide-brackets a^8 and at their lower ends against adjustable collars a^9.

Our object in pivoting the roll a^2 concentrically of the roll a, as above described, instead of pivoting it to the frame of the machine, as in our before-mentioned patent, is for the purpose of having the roll 3 moved concentrically of roll 1, so as to retain the full contact of the yarn on the latter roll, this arrangement giving much better results than when the roll 3 is raised away from roll 1 as the yarn becomes slack. According to our present arrangement the slacker the yarn becomes the more frictional contact it has on roll 1.

The beam B of any suitable kind is shown as mounted at one end in a bracket and at its other end in a shaft a^{12}, which communicates motion thereto, said shaft being journaled in brackets a^{13}, secured to the main frame, and being driven by a friction-clutch mechanism comprising opposite friction-disks $a^{14}\,a^{15}$, carried by a driving-gear a^{16}, driven by a gear a^{17}, fast on the power-shaft a^{18}, which carries the roll a. The disks $a^{14}\,a^{15}$ and their gear a^{16} are loose on the shaft a^{12} and the disks bear frictionally against opposite face plates or disks $a^{19}\,a^{20}$, which are splined to the shaft a^{12}, the former of said disks being yieldingly supported by a sensitive spring a^{21}. Against the disk a^{20} bears an externally-threaded sleeve a^{22}, mounted on the shaft a^{12} and free to move longitudinally thereon, but held against rotating therewith by a pin or bolt a^{23}, and on this sleeve is mounted an internally-threaded ratchet-wheel a^{24}, bearing against the adjacent bracket a^{13} and provided peripherally with ratchet-teeth to be engaged by one or more pawls carried by a depending bracket a^{25}.

The above-described mechanism may be and preferably is, excepting as mentioned, the same as shown in our before-mentioned patent, said patent showing automatic mechanism rotating the hand-wheel a^{24} in one direction or the other, according as the yarn or warp becomes too taut or slack. Our present invention, however, relates to the provision of means whereby greater sensitiveness and

delicacy of movement may be imparted to the automatic mechanism.

Preferably two pawls, as in our patent, are employed, said pawls being shown in detail in Figs. 7 and 8, where it will be seen that one pawl c is provided with a horizontally-extended tailpiece c', and the other pawl c^2 has a downwardly-projecting tailpiece c^3, one tailpiece having an eye c^4 and the other a hook c^5, whereby they may be conveniently connected by a spring c^6, tending to move the pawls upwardly to engage with the ratchet-teeth of the wheel a^{24}. The pawls are loosely mounted on a cross head or pin c^7, sliding in slots a^{26} in the lower end of the bracket a^{25}, said slots being held in planes at opposite sides of the hand-wheel or ratchet-wheel a^{24} by a bridge a^{27} and the pin c^7 being moved back and forth by any suitable means, herein shown as a link c^8, pivoted at c^9 to a bell-crank lever c^{10}, connected by a link c^{12} to any convenient place for receiving regular movement, shown as to an eccentric pin c^{13} on the power-shaft a^{18}.

The parts thus far described if left to themselves would simply cause the wheel a^{24} to be rotated back and forth, as the respective pawls might escape at one side or the other of the bridge a^{27} to engage with the ratchet-teeth of the wheel, and accordingly in order to restrict the operative movement of these pawls precisely as required, according to the conditions of the winding, and cause them to act upon the clutch mechanism only when the yarn is being wound either too tight or too slack, and then to act only to the extent required, we provide automatic mechanism which, although capable of many embodiments and a wide variety of arrangements and forms, is for convenience of explanation and illustration herein shown as follows: Mounted to slide relatively to the bridge a^{27} is a regulator or shield d, shown as resting on the bridge engaged by a lip or flange a^{28} at its rear edge and by a projection a^{29}, extending up through a slit d', adjacent the front edge of the shield, said shield having a wrist-pin d^2 at its front edge, on which is pivoted an operating-link d^3, pivoted at d^4 to a bell-crank d^5, connected by a pitman or link d^6 to the swinging lever a^3 to move with the movable roll a^2 as the latter is depressed by the tightening of the yarn or permitted to rise by the slackening thereof.

The operation of our improvement will be understood by viewing Figs. 1, 3, and 4, which show, respectively, the relative positions of the parts under a normal tension of the yarn, an undue tautness and an undue slackness thereon. When the yarn is being wound properly, the shield or regulator d occupies an intermediate position, as shown in Fig. 1, so that the reciprocating movement of the pawls fails to carry them into engagement with the ratchet-teeth, the pawls simply sliding alternately against the projecting ends of the shield. If, however, the strain or tension on the yarn is too great, the movable roll a^2 will thereby be depressed into the position shown in Fig. 3 and will automatically operate through the pitman d^6, bell-crank d^5, and link d^3 to slide the shield or regulator to the right into the position shown in Fig. 3, thereby entirely removing the obstruction from the ratchet-teeth at the left, so as to permit the pawl c to engage the ratchet-teeth and turn the wheel a^{24} to the greatest extent with each reciprocation of the link c^8. This operation turns the wheel a^{24} so as to move the sleeve a^{22} outwardly and release the frictional engagement of the clutching mechanism sufficiently to permit the shaft a^{12} to slip slightly relatively to its driving-gear a^{16}, and hence permit the beam B to rotate slightly slower than before. On the other hand, if the strain on the yarn is not sufficient to hold the weight a^6 and spring a^7 in their intermediate positions they will raise the swinging roll a^2 to the position shown in Fig. 4, and will thereby through the connecting parts shift the shield or regulator d into the position shown in Fig. 4, thereby exposing the ratchet-teeth at the right, so as to permit the pawl c^2 to turn the wheel a^{24} over to the left, and thereby move the sleeve a^{22} inwardly, bringing greater pressure to bear on the clutch mechanism and insuring a more positive and faster rotation of the winding-beam B. Also it will be understood that the shield or regulator d will be moved into various intermediate positions between the extremes shown in Figs. 3 and 4, according to the strain on the yarn, and will thereby expose the ratchet-teeth only to a corresponding degree, so that the pawls will be permitted to engage said teeth only during a correspondingly greater or less part of their reciprocating movement. If it is desired to throw the pawls out of action, all that is necessary is to unhook the spring c^6, whereupon the pawls drop into idle position.

As before stated, we do not intend to restrict ourselves to the details of construction shown.

Having described our invention, what we claim, and desire to secure by Letters Patent, is—

1. In a machine of the class described, a beam for receiving the yarn, means including friction mechanism for forwardly rotating the beam to wind on the yarn, automatic mechanism for increasing or diminishing the friction-pressure of the beam-turning mechanism, said automatic mechanism including a ratchet and continuously-operated pawl, and a regulator actuated by the tension of the yarn for rendering said pawl operative or inoperative, substantially as described.

2. In a machine of the class described, a beam for receiving the yarn, means including friction mechanism for forwardly rotating the beam to wind on the yarn, a pawl and ratchet for governing the friction-pressure of said friction mechanism, connections for operating said pawl, and automatic means independent of said connections actuated by the

tension of the yarn for regulating the effective engagement of said pawl with said ratchet, substantially as described.

3. In a machine of the class described, a beam for receiving the yarn, means including friction mechanism for forwardly rotating the beam to wind on the yarn, a pawl and ratchet for governing the friction-pressure of said friction mechanism, means for reciprocating said pawl a uniform distance, and means between the pawl and ratchet actuated by the tension of the yarn for limiting the effective engagement of the pawl with the ratchet, substantially as described.

4. In a machine of the class described, a beam for receiving the yarn to be wound, means including a movable tension device over which the yarn passes to said beam, said tension device being automatically moved by the strain of the yarn, driving means for the beam including friction mechanism, actuating means for positively varying the friction-pressure of said friction mechanism, and a regulating-slide connected with a moving part of said tension device, said slide regulating the effective movement of said actuating means, substantially as described.

5. In a machine of the class described, a beam for receiving the yarn to be wound, means including a movable tension device over which the yarn passes to said beam, said tension device being automatically moved by the strain of the yarn, driving means for the beam including friction mechanism, actuating means including a pawl and ratchet for positively varying the friction-pressure of said friction mechanism, and a regulating-slide connected with a moving part of said tension device, said slide operating between said pawl and ratchet for regulating the effective movement of said actuating means, substantially as described.

6. In a machine of the class described, a yarn-receiving beam, frictional driving means therefor, a ratchet for varying the degree of friction of said frictional driving means, and two pawls and a spring on the under side of said ratchet, each of said pawls having a tailpiece, said tailpieces crossing each other in divergent directions, and said spring being secured to one tailpiece and detachably hooked over the end of the other tailpiece, the unhooking of said spring instantly disengaging said pawls by gravity from said ratchet, substantially as described.

7. In a machine of the class described, a beam for receiving the yarn to be wound, driving means for the beam, a fixed roll, a movable roll, and tension devices operating on said movable roll, the yarn being led around said fixed roll and movable roll on opposite sides thereof, said movable roll being pivotally mounted adjacent said fixed roll, to move concentrically thereof, whereby the slacker the yarn becomes, the greater is the extent of its frictional contact with the fixed roll, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

GEORGE BROWN.
EMIL DICK.

Witnesses:
S. MERRITT FARNUM, Jr.,
CORNELIA PULSIFER.