(No Model.) 2 Sheets—Sheet 1.

J. M. LINSCOTT.

LET-OFF MECHANISM FOR LOOMS.

No. 501,518. Patented July 18, 1893.

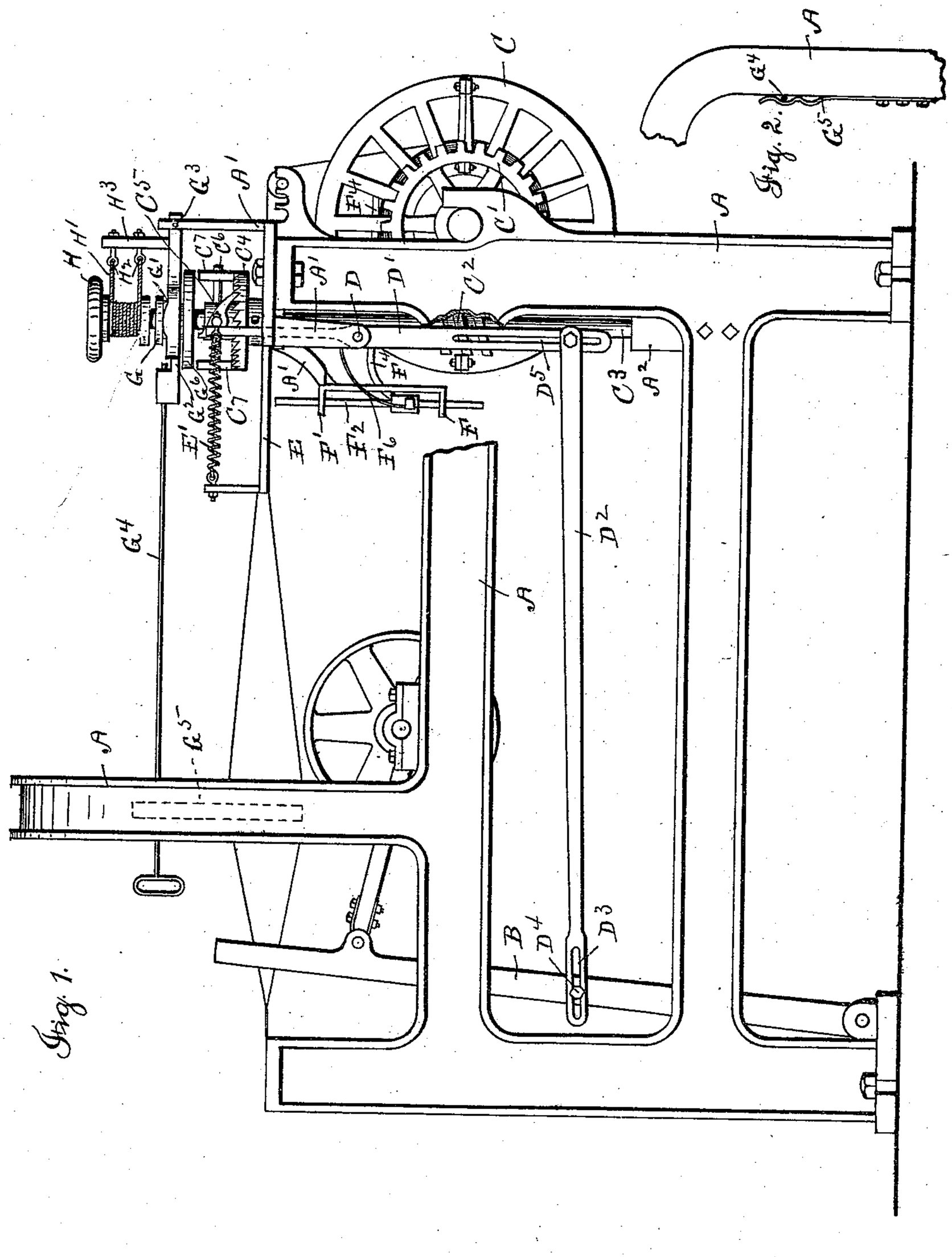

Fig. 1.

Fig. 2.

Witnesses
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Emma Hester.

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(No Model.) 2 Sheets—Sheet 2.

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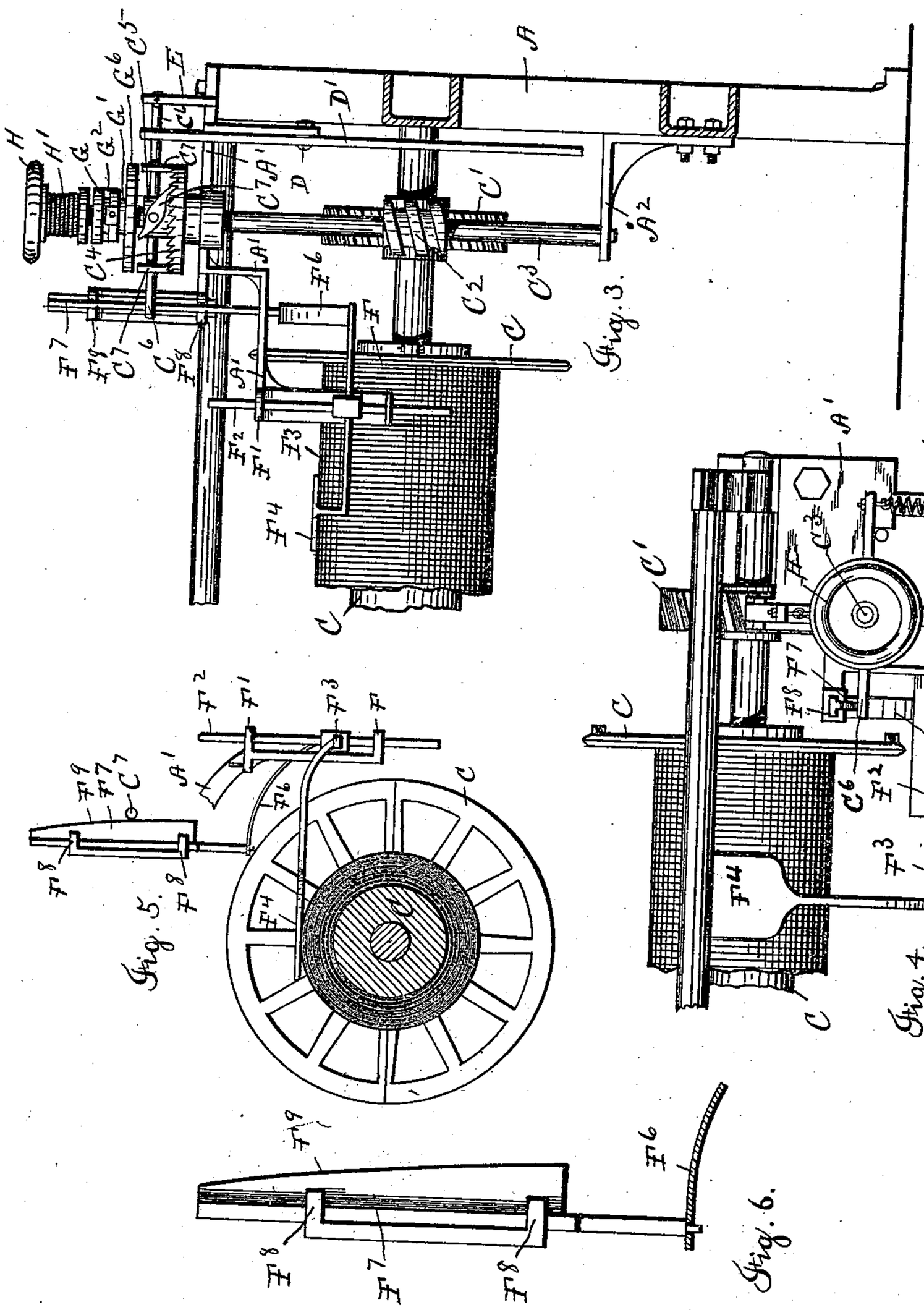

Fig. 3.

Fig. 4.

Fig. 5.

Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN M. LINSCOTT, OF WORCESTER, MASSACHUSETTS.

LET-OFF MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 501,518, dated July 18, 1893.

Application filed April 4, 1892. Serial No. 427,726. (No model.)

To all whom it may concern:

Be it known that I, JOHN M. LINSCOTT, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Let-Off Mechanisms for Looms, of which the following is a specification, accompanied by drawings, forming a part of the same and representing such portions of a loom as are necessary to clearly illustrate the nature and application of my present invention, and in which—

Figure 1 represents a side view of a let-off mechanism embodying my invention and showing its application to the loom. Fig. 2 represents a portion of the frame-work forming the head and representing the elastic blade for holding the lever by which the actuating pawls are disconnected. Fig. 3 is a front view of the let-off mechanism. Fig. 4 is a top view. Fig. 5 is a side view of that portion of the mechanism which is actuated by the warp upon the warp-beam and Fig. 6 is a detached view of the sliding cam plate the position of which is determined by the amount of warp upon the warp-beam.

Similar letters refer to similar parts in the different figures.

My invention relates to that portion of the loom known as the let-off mechanism by which the amount of warp delivered from the warp-beam during the process of weaving is determined and it has for its object to provide means by which the amount of warp delivered at each beat of the lay shall be uniform.

Referring to the drawings, A denotes the loom-frame.

A′ and A^2 denote the frame-work by which the let-off mechanism is supported, suitably attached to the loom.

B denotes the vibrating lay and C the warp-beam carrying the worm gear C′ engaged by the worm C^2 carried upon a shaft C^3 journaled in the supporting frame-work A′, A^2 and to which is attached a crown ratchet wheel C^4. Turning loosely upon the shaft C^3 is a collar C^5 carrying four radial arms C^6 upon which are pivoted the pawls C^7 engaging the ratchet wheel C^4.

Pivoted upon the frame-work at D is a lever D′ with its upper end bearing against one of the radial arms C^6 and having its lower end operatively connected with the lay B by means of a link D^2, provided with a slot D^3 inclosing a stud D^7 carried by the lay B; each forward beat of the lay B rocking the lever D′ upon its pivotal pin D and giving a short angular movement to the collar C^5 and to the ratchet wheel C^4 through the pawls C^7, causing an angular movement to be imparted to the warp-beam C by means of the worm C^2 and worm gear C′ and delivering the warp from the warp-beam.

An arm E projects from the frame-work of the loom to which one end of a spiral spring E′ is attached having its opposite end attached to one of the radial arms C^6, the tension of the spring E′ serving, upon the backward motion of the lay, to reverse the motion of the collar C^5 and lever D′.

The link D^2 is pivotally connected with the lever D′, which is provided with a slot D^5 to allow an adjustment of the link D^2 in order to vary the angular motion of the lever.

The frame-work A′, in which the upper end of the shaft C^3 is journaled, is provided with lugs F, F′ holding a sliding rod F^2 to which is attached a bar F^3, said bar carrying at one end a blade F^4 resting upon the warp F^5 wound upon the warp-beam C. The opposite end of the bar F^3 carries a curved bar F^6 the free end of which supports the cam plate F^7, which slides in ways F^8, F^8, in the frame A′. The cam plate F^7 is held in the path of one of the radial arms C^6 as the motion of the collar C^5 is reversed by the action of the spring E′. When the warp-beam is filled with warp the cam plate F^7 will be held in its highest position so that the radial arm brought in contact therewith will strike against the lower end of the cam plate, limiting the reverse motion of the collar C^5 and pawls C^7; but as the warp is unwound from the warp-beam, the blade F^4 and connected parts will descend by their own weight, allowing the cam plate F^7 to fall and receive the contact of the radial arm at a point constantly advancing upward upon the tapering edge F^9, thereby allowing the angular motion of the pawls C^7 to be gradually increased as the diameter of the warp decreases. By a proper construction of the tapering edge F^9 of the cam plate F^7 the angular motion of the warp-beam, as actuated by the let-off mech-

anism, will be gradually increased so as to accurately compensate for the decreasing diameter of the warp. It has, however, been found in practice that it is desirable to vary the tapering edge F^9 to correspond with extreme variations in the number of picks in each inch of the woven fabric, and to allow this change to be readily made, the cam plate F^7 is supported upon the curved bar F^6, but is not attached thereto, allowing the cam plate to be lifted out of its ways and other plates having a different taper, or inclination of the edge F^9, to be inserted as the coarseness, or fineness of the woven fabric may require. Sliding upon the shaft C^3 is a collar G having an annular groove G′, which receives a lever G^2 pivoted at G^3 to the rigid frame-work. The lever G^2 is extended by a rod G^4, which is held in position between the loom-side and a blade spring G^5.

The collar G is provided with a flange G^6 extending over the pawls C^7, the rear ends of which are turned upwardly above the radial arms C^6, so as to be struck by the flange G^6 as the collar G is moved down by the angular movement of the rod G^4, thereby disengaging the pawls C^7 from the ratchet wheel C^4.

Attached to the upper end of the shaft C^3 is a small hand-wheel H, around the hub of which is wound a friction cord, or strap H′, having its ends attached to the eye-bolts H^2, held in an arm projecting upward from the the lever G^2, so that when the rod G^4 is raised, allowing the pawls C^7 to engage the ratchet wheel C^3, the arm H^3 will be moved back, causing the friction cord H′ to bind tightly upon the hub of the hand-wheel H and offer a frictional resistance to the rotation of the shaft C^3; but when the rod D^4 is depressed carrying the flange G^6 down upon the pawls C^7 the friction cord H′ becomes slackened and the frictional resistance removed from the shaft C^3, permitting the warp-beam to be turned by the hand-wheel H.

By the employment of four pawls C^7 acting upon a single ratchet wheel C^4 and so spacing the teeth that the distance between the acting points of the pawls shall be equal to a certain number of teeth and a fraction of a tooth, I am able to secure a finer graduation without reducing the size of the teeth in the ratchet wheel.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination with the warp-beam of a loom, of a shaft operatively connected with said beam, a ratchet wheel carried on said shaft, a pawl engaging said ratchet wheel and actuated in one direction to rotate the warp-beam and deliver warp therefrom, a spring applied to reverse the motion of said pawl and a sliding cam plate by which the reverse movement of said pawl is limited, substantially as described.

2. The combination with a warp-beam, of a shaft operatively connected with said beam, a ratchet wheel carried by said shaft, a vibrating pawl actuating said ratchet wheel, a lever connected with the lay of the loom and actuating said pawl in one direction, a spring applied to reverse the motion of said pawl and a sliding cam plate by which the reverse motion of said pawl is limited, substantially as described.

3. The combination with a warp-beam, of a shaft C^3 operatively connected with said beam, a ratchet wheel C^4 attached to said shaft, and pawls C^7 carried upon arms extending radially from a collar C^5 turning on said shaft, a vibrating lever operatively connected with the lay of the loom and acting against one of said arms, and a sliding cam plate placed in the path of one of said arms to limit its reverse motion, substantially as described.

4. The combination with a warp-beam and a shaft operatively connected with said beam, of a ratchet wheel carried by said shaft, actuating pawls operatively connected with the moving parts of the loom by which said pawls are moved in one direction to rotate the warp-beam and deliver warp therefrom, a spring applied to reverse the motion of said pawls, a sliding cam plate by which the reverse motion of said pawls is limited and a movable frame actuating said cam plate, said frame comprising the sliding rod F^2, bar F^3 attached to said rod and carrying a plate F^4 resting upon the warp wound on the warp-beam and a bar F^6 supporting said cam plate, substantially as described.

5. The combination with a shaft C^3 operatively connected with the warp-beam, of a ratchet wheel C^4, pawls C^7, and sliding flanged collar G by which said pawls are released from the ratchet wheel, substantially as described.

6. The combination with a shaft C^3 operatively connected with the warp-beam, of a ratchet wheel attached to said shaft, pawls C^7, sliding collar G provided with a flange G^6, pivoted lever G^2 engaging said collar, arm H^3 carried by said lever, and a friction cord H′ connected with said arm and applied to resist the rotation of the shaft C^3, substantially as described.

Dated the 29th day of March, 1892.

JOHN M. LINSCOTT.

Witnesses:

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EMMA KESTER.