No. 610,636. Patented Sept. 13, 1898.

J. H. NORTHROP.

TAKE-UP MECHANISM FOR LOOMS.

(Application filed Feb. 18, 1898.)

(No Model.) 2 Sheets—Sheet 1.

Fig. 1

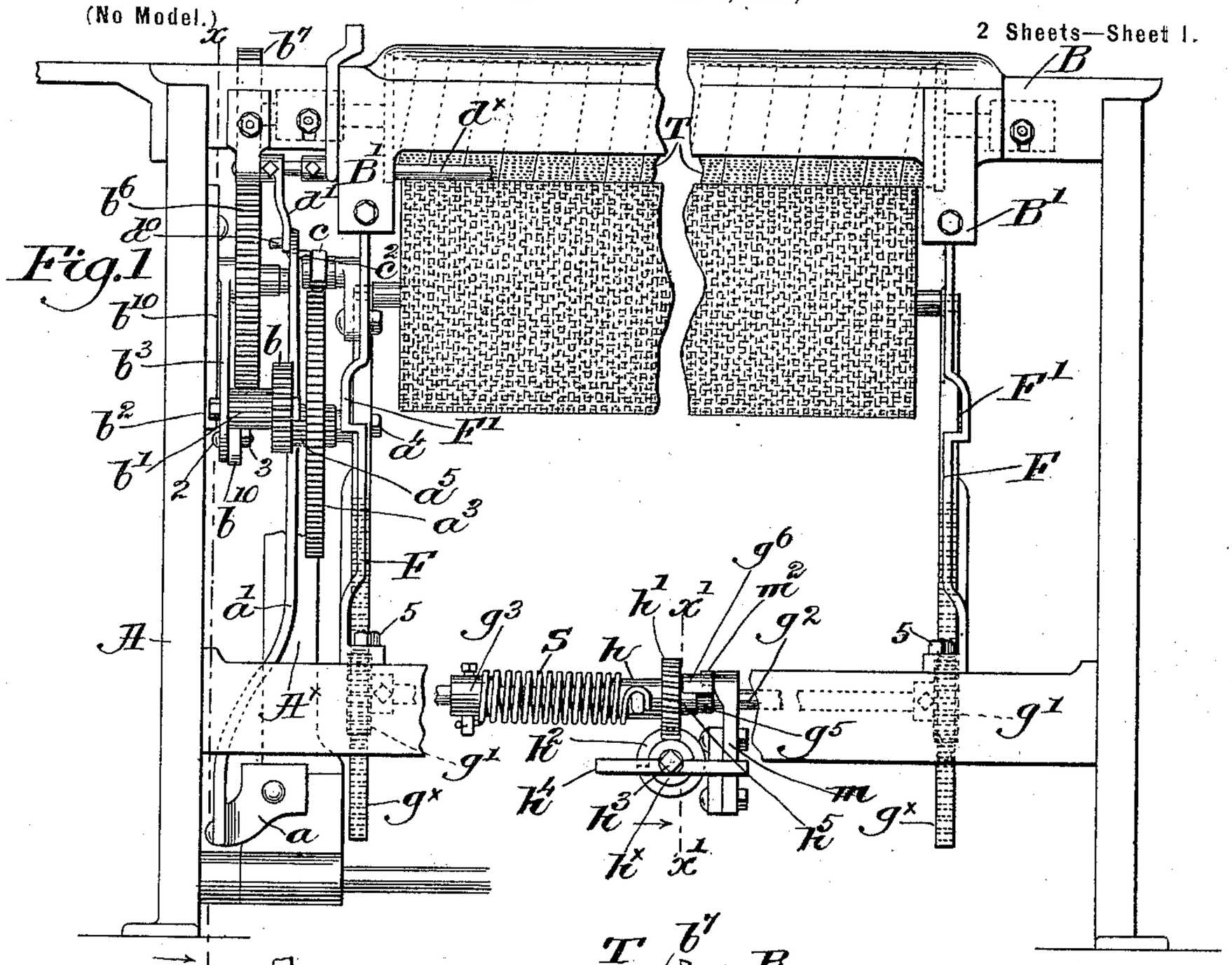


Fig. 2

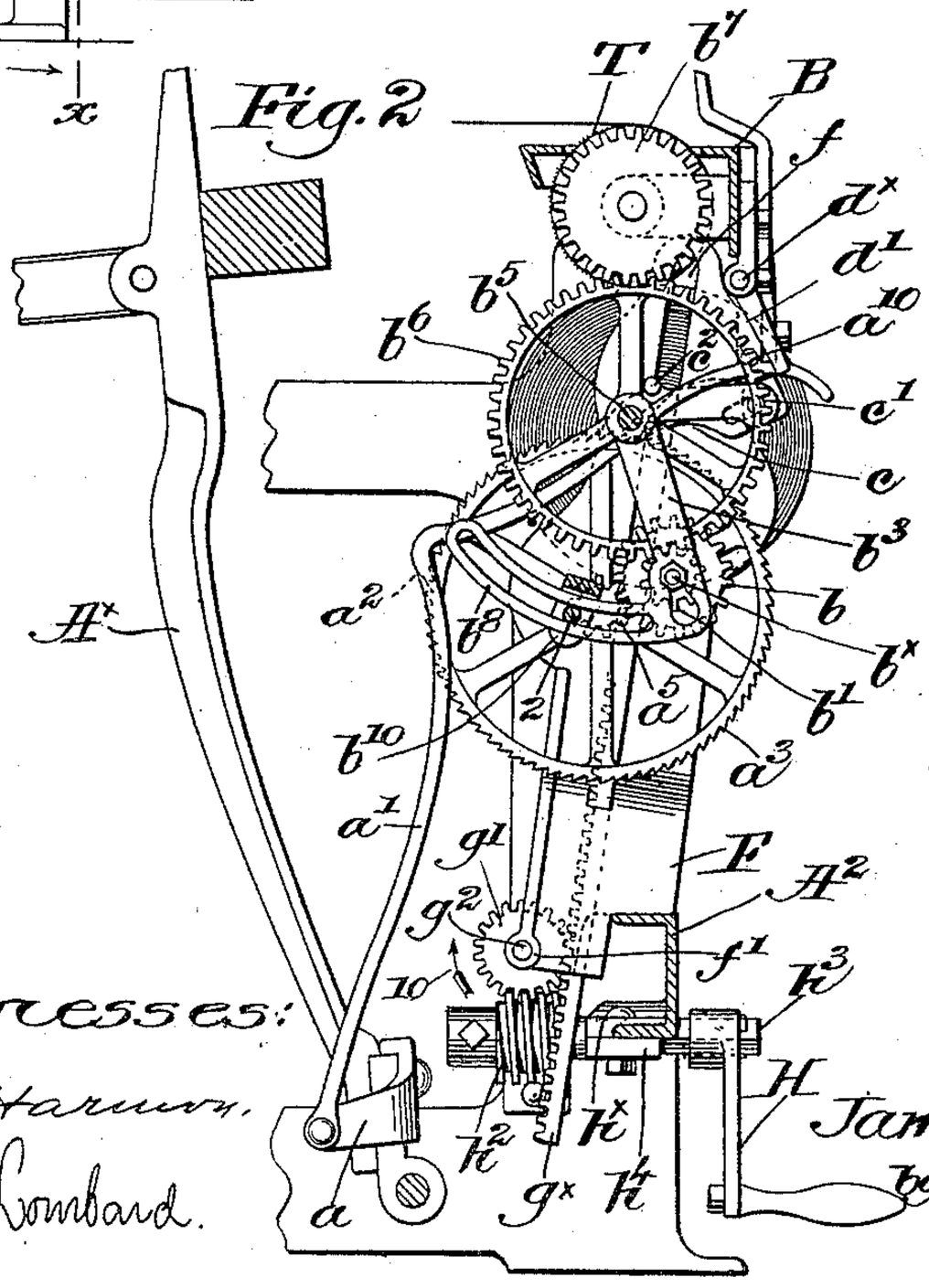


Fig. 3.

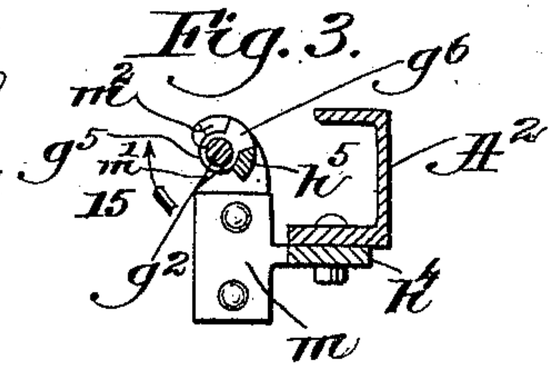
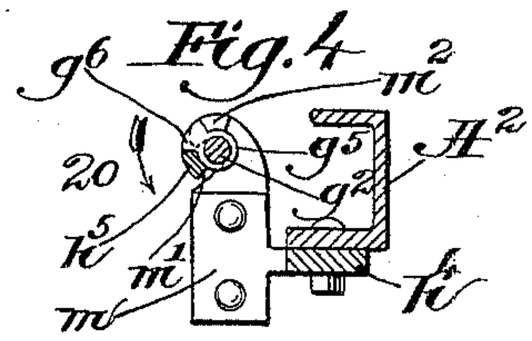


Fig. 4



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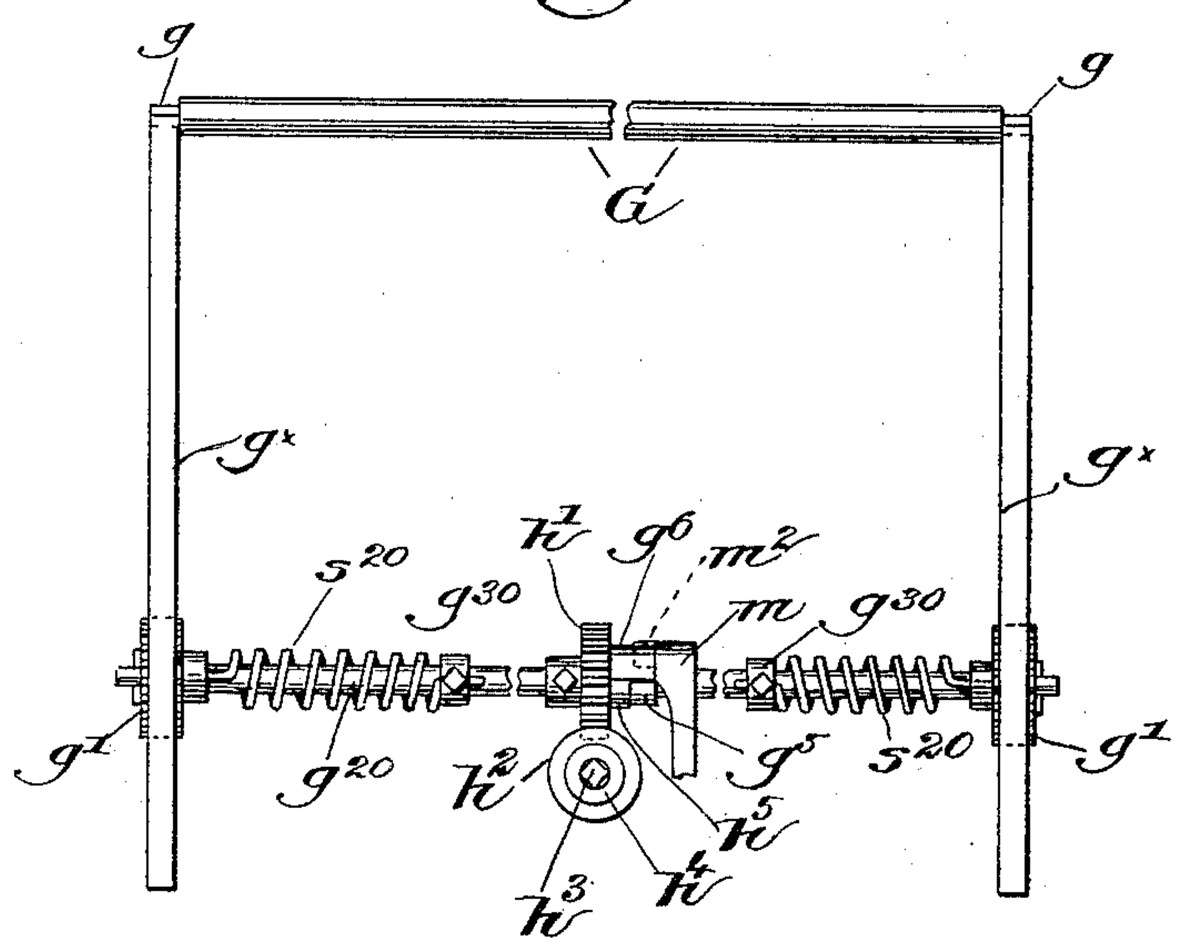
TAKE-UP MECHANISM FOR LOOMS.

(Application filed Feb. 18, 1898.)

(No Model.) 2 Sheets—Sheet 2.

Fig. 5.



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UNITED STATES PATENT OFFICE.

JAMES H. NORTHROP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE DRAPER COMPANY, OF SAME PLACE AND PORTLAND, MAINE.

TAKE-UP MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 610,636, dated September 13, 1898.

Application filed February 18, 1898. Serial No. 670,739. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. NORTHROP, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Take-Up Mechanism for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

This invention has for its object the production of novel take-up mechanism for looms, whereby the cloth-roll is kept firmly but with a yielding pressure against the take-up roll, means being provided for readily removing the cloth-roll from its bearings.

Figure 1, in front elevation and centrally broken out, represents a loom with my invenvion applied thereto. Fig. 2 is a vertical section thereof on the line $x\ x$, Fig. 1, looking toward the right. Figs. 3 and 4 are detail views, on the line $x'\ x'$ of the device, for limiting the movement of the cloth-roll supports; and Fig. 5 is a centrally-broken-out view in elevation of a modified form of device for controlling the supports for the cloth-roll journals.

The lay-sword $A^\times$ is shown as provided with a bracket a near its lower end, to which is pivoted the pawl-carrier a', provided with a take-up pawl a^2 (see dotted lines, Fig. 2) to engage the teeth of the ratchet-wheel a^3, mounted to rotate on a stud a^4, and having an attached pinion a^5.

A gear b, having a long attached pinion b', is rotatably mounted on a stud $b^\times$, held by a suitable nut b^2 in an arm b^3, pivoted on the stud b^5, extended inward from the loom side A, on which stud the large gear b^6 is rotatably mounted. The small gear b is in mesh with and is driven by the ratchet-wheel pinion a^5, and the large gear b^6 is in mesh with the pinion b', by which rotation is imparted to said gear b^6, the latter in turn meshing with a gear b^7, fast on the shaft of the take-up roll T.

A slotted quadrant b^8, forming a part of the arm b^3, is held in adjusted position by means of a bolt 2 and nut 3, the bolt passing through a hole in a bracket b^{10}, secured to the inner face of the loom side A and bent to cross over to the inner side of the quadrant. As will be understood, the arm b^3 supports the change-gear, and by means of the quadrant it is held in adjusted position.

The detent-pawl c, slotted to receive the fulcrum-stud c', has a lateral lug c^2, which is engaged by the pawl-carrier when the pawl a^2 is disengaged from the ratchet-wheel, such disengagement being effected by the engagement of an arm d' on the usual controlling-shaft $d^\times$ with a lug a^{10} on the pawl-carrier a'.

A cross-girth A^2, connecting the lower sides, has bolted thereto at 5 upright stands F, attached at their upper ends to brackets B', depending from the breast-beam B, said stands F having longitudinal guide-slots f, Fig. 2, therein, the stands being bent or offset outwardly at F', for a purpose to be described.

The journals g of the cloth-roll shaft G are adapted to rest in open sockets in the upper ends of rack-bars $g^\times$, which slide in the slots of the stands F, each rack-bar being in engagement with a rack-gear g', fast on a shaft g^2, mounted in bearings f' of the stands at or near their lower ends. A collar g^3, fast on said shaft, has attached thereto one end of a strong spiral spring S, encircling the shaft, the other end of the spring being attached to the hub h of a worm-gear h', loosely mounted on the shaft, said gear meshing with a worm h^2 on a shaft h^3, mounted in a bearing $h^\times$ on a bracket h^4, secured to the cross-girth A^2, the shaft extending toward the front of the loom. The worm locks the worm-gear h' from rotation, and the spring continually tends to turn the shaft g^2 oppositely to the arrow 10, Fig. 2, to maintain the rack-bars elevated, and thereby press the cloth-roll tightly, yet with a yielding pressure, against the take-up roll T, so that the cloth will be wound in a compact hard roll, the shaft g^2 and gears g' constituting means to positively connect the sliding cloth-roll supports to effect the movement of said supports in unison. As the weight of the cloth-roll increases the rack-bars $g^\times$ are depressed, rotating the shaft g^2 in the direction of the arrow 10, winding up the spring S and gradually increasing its tension to compensate for the increased weight of the cloth-roll. When the cloth-roll journals g reach the offset portions F' of the

stands, a suitable handle H is applied to the worm-shaft h^3, and the latter is rotated by hand to unwind the spring, and the roll of cloth is removed, the length of the roll-journals being preferably such that they extend into the slots *f*, whereby lateral displacement is prevented except at the offset portions F of the stands. When a new roll-shaft is inserted at the offsets F′, the shaft h^3 is oppositely rotated to wind up the spring, the tension of the latter acting to effect rotation of the shaft g^2 to thereby elevate the rack-bars $g^\times$ and the roll-shaft into position against the take-up roll ready to wind a fresh roll of cloth.

When not in use, the crank or handle H is reversed on the worm-shaft h^3, so that it will not interfere with the movements of the attendant, and also for the purpose of preventing the worm-shaft from turning by the jar of the loom.

I have provided a novel device for positively limiting the winding and unwinding of the spring by hand, so that it will be stopped at the proper points when the tension is released to remove the wound roll of cloth and also when the spring is rewound preparatory to beginning the winding of a new roll.

A segmental lug h^5 projects laterally from the right-hand face of the worm-gear h', viewing Fig. 1, and a loose collar g^5 on the shaft g^2 has a projection g^6 in the path of the lug h^5. Beyond the collar an upright stand *m*, attached to the bracket h^4, has a hooked or notched upper end m' to partially embrace the shaft g^2, Figs. 3 and 4, while on its inner face the stand *m* is provided with a lateral stop m^2, extending into the path of the projection g^6 of collar g^5. Remembering that the worm-gear h' is normally locked, the segmental lug h^5 will be in the position shown in Figs. 1 and 3 when the winding of the roll is completed. Now rotation of the said gear in the direction of arrow 15, Fig. 3, will carry the said lug h^5 around until it engages the opposite side of the projection g^6 on the loose collar g^5, and then both lug and projection will be moved in unison until the leading edge of the projection g^6 engages the fixed stop m^2, Fig. 4, and further rotation of the worm-gear will be prevented. The spring is then unwound sufficiently, and the roll of cloth is removed and a new roll-shaft inserted and mounted on the rack-bars. From the position shown in Fig. 4 the worm-gear is then rotated in the direction of arrow 20, the lug h^5 moving away from the projection g^6 and again engaging its opposite side and moving it thereafter with the lug until the outer side of the fixed stop m^2 engages the projection on the loose collar, as in Fig. 3, stopping the rotation of the worm-gear. The spring will thus be wound up sufficiently to rotate the shaft g^2 and elevate the rack-bars $g^\times$ into starting position.

From the foregoing description it will be obvious that no matter how careless the manipulation of the worm-shaft the spring can only be wound up or unwound to a predetermined extent and that the angular position of the shaft is fixed after rotation in one direction or the other.

In the construction shown in Fig. 5 the toothed rack-bars $g^\times$, to support the journals *g* of the cloth-roll shaft G, are as hereinbefore described, and the worm-gear h', meshing with the worm h^2, fast on the shaft h^3, mounted in a bearing h^4, the segmental lug h^5 on the worm-gear, the projection g^6 on the loose collar g^5, and the upright stand *m*, having the lateral stop m^2, are also of like construction as shown in Fig. 1. The shaft g^{20}, however, is, in the modified form of my invention, extended loosely through the gears g' in mesh with the rack-bars, and the worm-gear h' is fast on said shaft. Spiral springs s^{20}, coiled around the shaft, are attached at their outer ends to the gears g' and at their inner ends to collars g^{30}, which are fast on the shaft. From the construction shown it will be obvious that as the roll of cloth increases in weight it will descend, forcing the rack-bars $g^\times$ downward, and thereby rotating the gears g' in such a direction that the springs s^{20} will be wound up or increased in tension, the engagement of the worm-gear and worm locking the shaft g^{20} against rotation, so that the inner ends of the springs will be held fixed. When it is desired to relieve the spring tension, the worm-shaft is rotated manually to unwind the spring sufficiently from the inner end. The controlling mechanism to govern the extent of rotation of the worm-gear h' is precisely as shown and described hereinbefore and operates in the same manner.

In either form of my invention herein illustrated the roll of cloth is maintained pressed against the take-up roll firmly yet yieldingly, and the tension of the spring is varied by manually-operated means.

My invention is not restricted to the precise construction and arrangement herein shown, as the same may be modified or rearranged without departing from the spirit and scope of my invention.

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

1. In a loom, sliding supports upon which the journals of the cloth-roll are mounted, connections between said supports to effect their movement in unison, and means to control said movement with a variable resistance.

2. In a loom, sliding supports for the cloth-roll journals, fixed guides for the supports, having open portions to permit insertion and removal of the cloth-roll journals, and spring-controlled means connecting and to govern the movement of said supports in unison.

3. In a loom, fixed guides, rack-bars movable thereon and adapted to support the cloth-roll journals, a shaft having gears fast thereon, said gears meshing with the rack-bars, and a spring adapted to control the rotation

of the shaft and thereby the movement of the rack-bars.

4. In a loom, sliding supports for the cloth-roll journals provided with rack-teeth, a shaft geared to said supports to effect their movement in unison, a controlling-spring attached at one end to the shaft and fixed at its other end, and means to manually vary the spring tension.

5. In a loom, fixed guides, rack-bars movable thereon and adapted to support the cloth-roll journals, a shaft having gears fast thereon, said gears meshing with the rack-bars, a worm-gear loose on the shaft, a meshing worm, to normally lock said gear, and a spring attached at its ends to said shaft and worm-gear respectively, to control the movement of the rack-bars, rotation of the worm-shaft acting to relieve the tension of the spring.

6. In a loom, fixed guides, rack-bars movable thereon and adapted to support the cloth-roll journals, a shaft having gears fast thereon, said gears meshing with the rack-bars, a worm-gear loose on the shaft, a meshing-worm shaft, to normally lock said gear, and a spring attached at its ends to said shaft and worm-gear respectively, to control the movement of the rack-bars, rotation of the worm-shaft acting to relieve the tension of the spring, combined with means to positively limit the rotative movement of said worm-shaft.

7. In a loom, toothed, sliding, cloth-roll supports, a rotatable shaft, gears fast thereon in mesh with said toothed supports, a worm-gear loose on said shaft and having a laterally-projecting lug, an adjacent collar loose on the shaft and having a projection in the path of said lug, and a fixed stop adapted to engage said projection and limit the rotative movement of the collar, combined with a spring connected at its ends to said shaft and worm-gear respectively, and a worm-shaft to manually rotate the worm-gear, the lug, projection and stop coöperating to limit the rotative movement of the worm-gear in either direction.

8. In a loom, the take-up roll, fixed stands below it, longitudinally slotted and having openings for the entrance and removal of the cloth-roll shaft, sliding supports for said shaft, movable on said stands within the slots thereof, connections between and to effect simultaneous movement of said sliding supports, and a single controlling-spring connected with said connections and adapted to maintain the cloth-roll yieldingly against the take-up roll, with a pressure which increases as the weight of the cloth-roll increases.

9. In a loom, connected, longitudinally-movable supports for the journals of the cloth-roll shaft, a controlling-spring for said supports, located and arranged to be wound up as the weight of the cloth-roll increases, to thereby increase the tension of the spring, and independent means to decrease the spring tension when the cloth-roll is to be removed from its supports.

10. In a loom, connected, longitudinally-movable supports for the journals of the cloth-roll shaft, a controlling-spring for said supports, located and arranged to be wound up as the weight of the cloth-roll increases, to thereby increase the tension of the spring, independent means to unwind or wind the spring, and a device to positively limit the effective operation of said means.

11. In a loom, longitudinally-movable cloth-roll supports provided with teeth, a connecting-shaft geared to said supports to effect their movement in unison, a spring attached at one end to said shaft, means to normally hold the other end of the spring fixed, and a controlling device for said means.

12. In a loom, longitudinally-movable cloth-roll supports provided with teeth, gears in mesh with said toothed supports, spring-controlled means connected with and to govern the rotation of the gears and thereby the longitudinal movement of the supports, and a governing device for said means.

13. In a loom, sliding supports for the cloth-roll journals, provided with rack-teeth, spring-controlled gears meshing with said rack-teeth, the resistance of the gears to rotation increasing as the weight of the roll of cloth increases, and normally-locked, manually-operated means to relieve the gears from the spring control, or vary the latter.

14. In a loom, a fixed guide, a longitudinally-movable rack-bar thereon and adapted to support a journal of the cloth-roll shaft, a gear meshing with said bar, a spring to control the rotation of the gear, and means to manually vary the spring tension.

15. In a loom, a fixed guide, a longitudinally-movable rack-bar thereon and adapted to support a journal of the cloth-roll shaft, a gear meshing with said bar, a spring to control the rotation of the gear, a worm-gear with which one end of the spring is connected, and a meshing-worm shaft, to normally lock said worm-gear.

16. In a loom, a fixed guide, a longitudinally-movable rack-bar thereon and adapted to support a journal of the cloth-roll shaft, a gear meshing with said bar, a spring to control the rotation of the gear, a worm-gear with which one end of the spring is connected, and a meshing worm, to normally lock said worm-gear, combined with means to positively limit the rotative movement of said worm-gear.

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

JAMES H. NORTHROP.

Witnesses:

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GEO. OTIS DRAPER.