A. B. TAYLOR & S. WILCOX, Jr.

LET OFF AND TAKE UP MOTION FOR LOOMS.

No. 9,596. Patented Feb. 22, 1853.

Fig. 1.

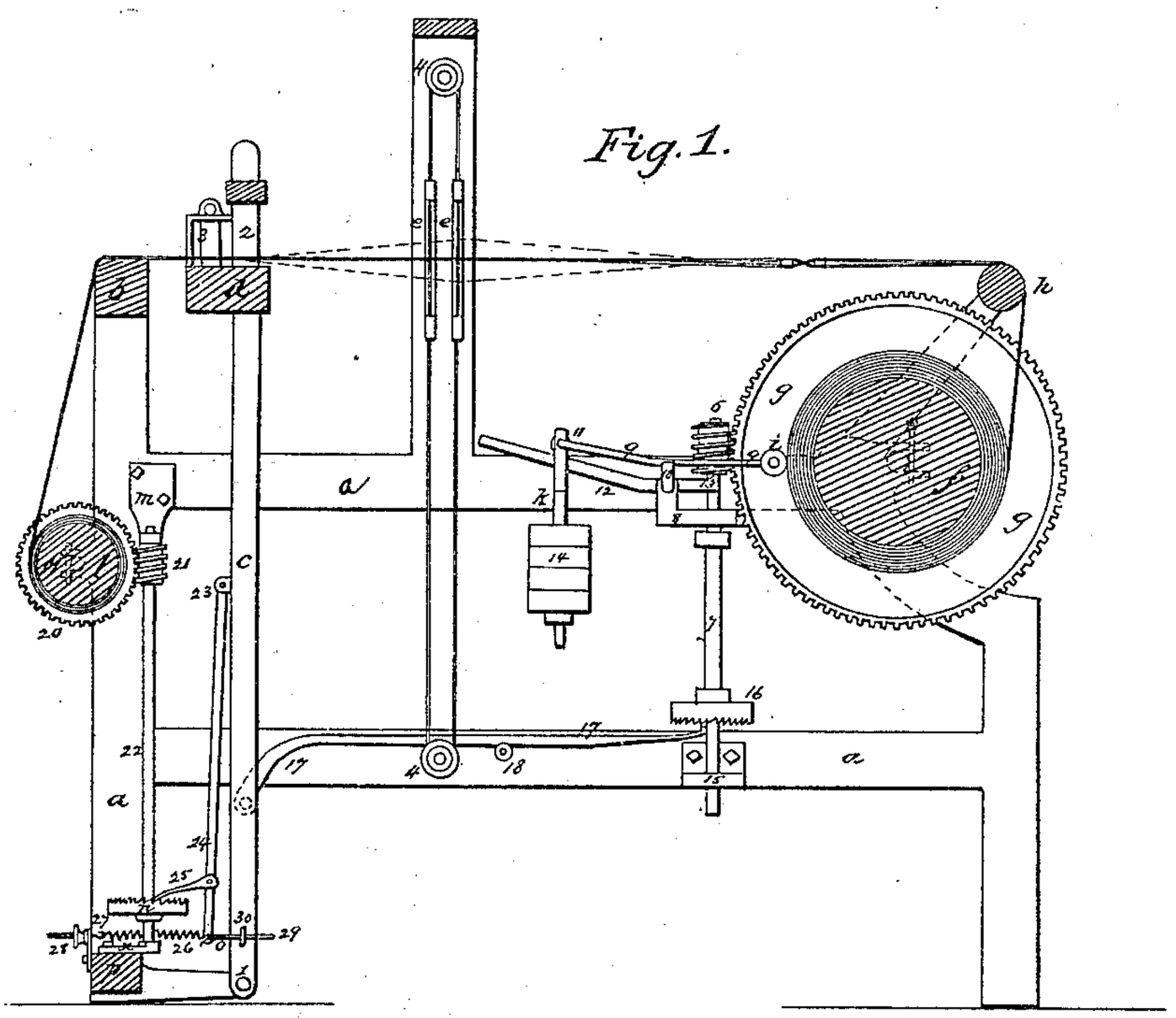


Fig. 2.

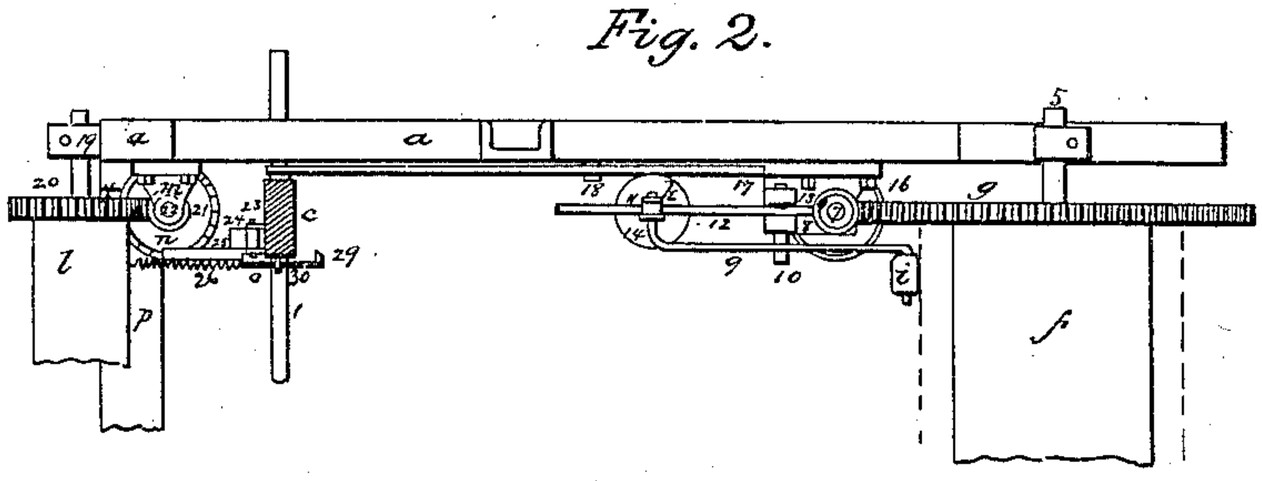
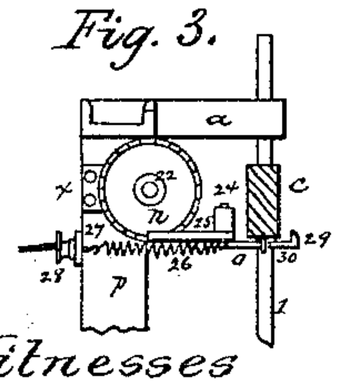


Fig. 3.



Witnesses

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UNITED STATES PATENT OFFICE.

A. B. TAYLOR, OF MYSTIC, CONNECTICUT, AND S. WILCOX, JR., OF WESTERLY, RHODE ISLAND.

LET-OFF MOTION FOR LOOMS.

Specification of Letters Patent No. 9,596, dated February 22, 1853.

To all whom it may concern:

Be it known that we, AMOS B. TAYLOR, of Mystic, New London county, and State of Connecticut, and STEPHEN WILCOX, Jr., of Westerly, in the county of Washington and State of Rhode Island, have invented, made, and applied to use certain new and useful improvements in let-off and take-up motions for looms, whereby the warp and cloth are kept at a more uniform tension and the cloth made of a more even thickness; and we hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing, making part of this specification, wherein—

Figure 1, is a sectional elevation of the loom with our improvements attached; Fig. 2, is a plan of one side of the loom, showing the "let off" and "take up" motion as applied to the yarn beam and cloth roller; and Fig. 3, is a plan of the lower part of the take up motion.

The like marks of reference designate the same parts.

a, is the frame of the loom made in any usual manner. *b*, is the breast beam. 1, is the rock shaft. *c*, are the swords of the lay *d*. 2, are the reeds and 3, the shuttle box. *e*, are the heddles, and 4, the rollers and harness to the same. These parts may be of any usual character and adapted to any desired kind of weaving, and are merely introduced herein to illustrate the working of the "let off," and "take up" motions, which motions are equally applicable to all kinds of looms, and character of weaving.

f, is the yarn beam on centers 5, in journals on the frame *a*.

g, are the heads of the yarn beam, one of which is formed as a spur wheel moved by a worm pinion 6, on a shaft 7, set in bearings 8 and 15, on the frame *a* so that the shaft 7, is allowed a certain amount of sliding motion in the journals, which is determined by a collar around the shaft 7, taking the under side of the journal 8.

10, is a center pin through lugs on the upper journal or bearing 8, carrying a lever 12, the short end of which is formed as a fork 13, taking the under side of the pinion 6.

i, is a roller on the end of a rod 9, which rod rests on the outer end of the pin 10, and slides over it. 11, is a roller at the other end of the rod 9, setting on the upper side of the lever 12, and having a sling and rod *k*, that receives the roller 11, in its upper end and passes the lever 12, through the jaw of the sling; the rod *k*, carries weights 14, which are of the proper size to effect the object intended as next set forth.

The warp from the yarn beam *f*, passes over the whip roller *h*, through the heddles *e*, and reeds 2, the cloth going over the breast beam *b*, to the cloth roller *l*. The roller *i*, setting against the warp, allows the roller 11, to roll down the inclined lever 12, as the warp becomes less in size on the beam, keeping the weight 14, the same distance from the warp whatever size the warp may be. By reference to Fig. 1, it will be seen that the warp, as it is drawn by the lay forcing the filling into the cloth, tends to force the worm 6, and shaft 7, downward sliding the shaft in the bearings 8, and 15, but the tendency of the lever 12, and weight 14, is to raise the pinion 6, and shaft 7, by the fork 13, so that as the warp is strained by driving the filling into the cloth, the weight 14, is raised, and the pinion 6, depressed until the sliding motion of the shaft 7 brings a ratchet wheel 16, which is attached to it, down sufficient to cause the teeth of the ratchet wheel to take a vibrating or sliding spring pawl or click 17, attached to the lay and supported by a roller or bearing 18. When the ratchet wheel takes this spring click it is rotated one tooth each stroke of the lay, turning the shaft 7, and worm pinion 6, in the direction to rotate the yarn beam and give off the yarn, which being lengthened more than is taken up by the filling, the tension still being maintained by the lever 12, and weight 14, these descend as the worm pinion is screwed up on the spur wheel *g*, and still maintain the same strain on the warp, but lift the ratchet wheel 16, out of the way of the pawl 17, in which position it remains until the straining or taking up of the warp causes the wheel again to take the sliding pawl or click letting off more yarn from the yarn beam. It will thus be seen that the resisting power to the warp unwinding is the weighted lever applied direct, (without friction of straps

or cords which always operate unequally) to the wheel *g* on the yarn beam through the pinion 6, and that this weight 14, is drawn nearer to the fulcrum of the lever 12, as the yarn is unwound, equalizing the power required to pull off the yarn, as the size of the warp on the roller grows less. The power applied to pull off the yarn being the filling the same as where friction straps are used, if the weight 14, is heavier the cloth will be closer, and if lighter it will be thinner, and the weight being applied direct does not cause the inequalities in the cloth consequent upon the jerking and giving motion produced where friction is depended on.

On one end of the cloth roller *l*, is a spur wheel 20, into which a worm pinion 21, gears; this pinion 21, is on a vertical shaft 22, supported by a bearing *m*, at the upper end on the frame *a*, and below by a bearing *x*, on a cross piece *p*. *n*, is a ratchet wheel near the lower end of the shaft 22. 23, is a knuckle joint on the lay sword *c*, carrying a vertical rod 24, so set as to carry a click or pawl 25, to take the teeth of the wheel *n*. 26, is a contractile helical spring attached to the lower end of the rod 24, and adjusted to pull the rod forward with more or less power by means of a screw rod, taking the end of the spring and passing through an ear 27 with a nut 28, to tighten or slacken the spring. *o*, is a rod attached to the lower end of the rod 24, passing through and guided by a staple 30 on the side of the lay sword *c*. 29, is the bent end of the rod taking against the back of the sword *c*. The length of this rod *o*, must be such that when the point 29 takes against the back of the sword the rod 24 will stand sufficiently away from the face of the sword, that if pressed back against the sword one tooth would be taken up by the pawl 25, thereby allowing the lay to vibrate without taking up a notch on the ratchet each vibration thus permitting the spring to act and the position of these parts on the lay sword must be at a sufficient distance from the rock shaft 1, that the requisite motion will be obtained. The operation of this take up motion is as follows: The lay on its forward motion releases the catch 29 and allows the spring to act on the pawl 25, and force around the ratchet wheel as far forward as possible giving the wheel *n*, a corresponding motion and through the shaft 22, and worm pinion 21, strains the cloth tight and the worm pinion holds whatever has been taken up without requiring ratchets, whether that amount of cloth taken up be much or little. On the back motion of the lay the rod *o*, slides through the staple 30, until the point 29, taking against the lay sword pulls the rod 24, slightly backward, but this is not enough to take up a tooth on the wheel *n*, and as soon as relieved by the forward motion of the lay the spring 26, through the rod 24, and pawl 25, tends to rotate the wheel *n*, which it does as soon as the filling, being struck into the cloth, so far relieves the strain of the warp as to allow the power of the spring to turn the pinion 21, taking up and holding just the amount of the filling; this is continued each stroke of the lay until the spring has so far detached the rod 24, from the lay sword that the wheel *n*, is turned sufficient that the back motion caused by the point 29 draws the pawl 25, over to take up another tooth on the wheel *n*, but in this position the forward motion of the lay does not cause the sword *c*, to strike against the rod 24, the object of this arrangement being merely to strain the spring out again and cause it to rotate the parts, as the blow of the lay relieves the strain on the cloth roller, and allows of its partial rotation.

It is thus seen that our "let off" and "take up" are worked by the lay, but are not absolute motions like many that have been used, neither are they dependent in any respect on friction, but both are a given power applied to strain the warp and the cloth, irrespective of the motion of the lay, except when the power is nearly expended it is again made effective by the lay in the one case again straining the spring, and in the other case letting off sufficient warp to allow the weight to descend to its former position. And it will be evident that a right angle crank with a weight on the horizontal arm might be applied to draw the click 25 forward in place of the spring 26, and would be a mere substitute operating in the same manner as the spring.

It will be seen that in place of the shaft 7 sliding in its bearings the pinion 6 might be made to slide on a key on the shaft, and so connected with the sliding pawl or click 17 as to bring it into action on the wheel 16, when the worm pinion 6 is depressed, and also that the shaft 7, might be placed horizontal and the lever 12, bent at a right angle so as to slide the pinion in this position and cause the let off motion to operate, the ultimate strain of the warp still depending on the weight and lever applied, without depending on friction, to the yarn beam, although we prefer the arrangements herein set forth and shown.

We do not claim the roller against the warp by which the position of the weight is regulated, neither do we claim the ratchet wheel and worm pinion moved by a pawl or click from the lay, as these have before been used.

What we desire to secure by Letters Patent is—

Effecting and regulating the let off motion by the variable counterpoise lever in combination with the sliding worm pinion,

when said worm pinion is acted on by the yarn beam through a direct strain communicated to it by the tension of the warp; the whole arranged and combined in the manner specified.

In testimony whereof we have hereunto set our signatures this twelfth day of August one thousand eight hundred and fifty-two.

A. B. TAYLOR.
STEPHEN WILCOX, Jr.

Witnesses:
THOMAS PERRY,
WILLIAM P. COY.