

R. Reynolds. *Let-Off Motion.*

N^o 88,906.

Patented Apr. 13, 1869.

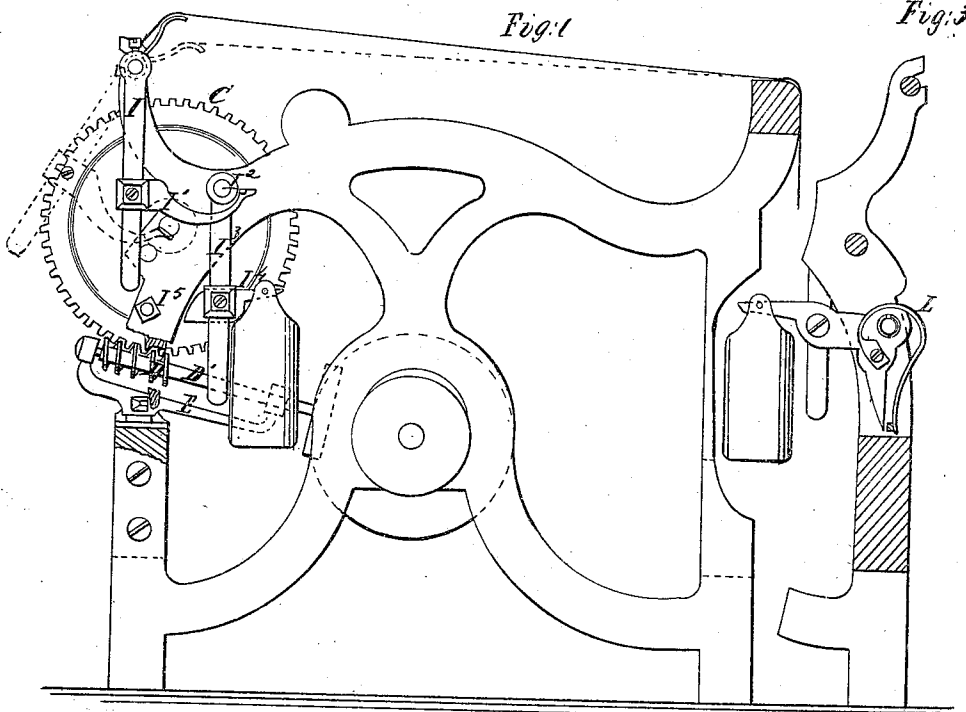
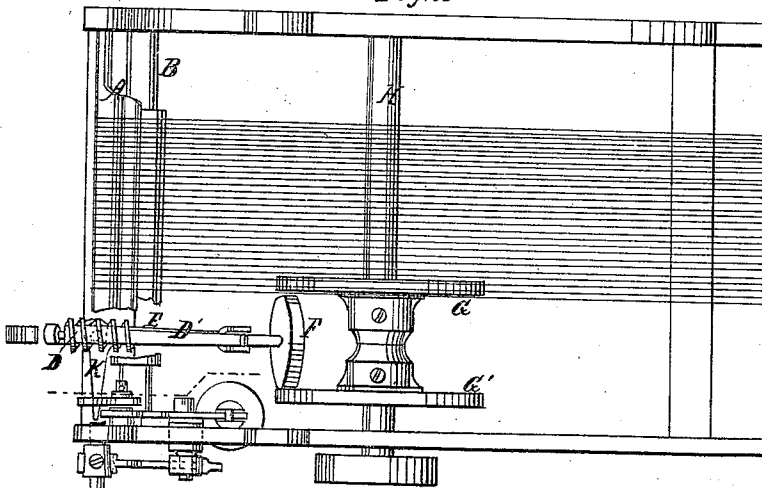


Fig. 2



Witnesses

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RENSSELAER REYNOLDS, OF STOCKPORT, NEW YORK.

Letters Patent No. 88,906, dated April 13, 1869.

IMPROVEMENT IN LET-OFF MECHANISM FOR LOOMS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, RENSSELAER REYNOLDS, of Stockport, in the county of Columbia, and State of New York, have invented a new and useful Improvement in Looms; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 represents a side elevation of a loom-frame, with my improvements applied thereto, with a part broken out of the frame;

Figure 2 represents a plan view, with parts removed; and

Figure 3 represents a sectional elevation, taken on the line *x x* of fig. 2.

Similar letters of reference indicate like parts.

This invention relates to improvements in the let-off motion for looms, patented to me on the 21st day of May, 1861, and also to an improved method of relieving the warp when the stop-motion fails to protect, as it sometimes occurs.

It consists in arranging the yarn-beam for winding the yarn on again, in case too much is let off; also, an arrangement for throwing down the whip-roll, to relieve the warp, by the tension of the same, when it becomes unduly increased by the failure of the shuttle to "box;" and also in certain improvements in the arrangement of the let-off mechanism.

A represents the whip-roll, and

B, the yarn-beam.

On the latter, a worm-wheel, C, is arranged.

D is a worm, secured to a worm-shaft, D', arranged in the vibrating frame E, and having a friction-wheel, F, on its inner end, working in connection with the friction-disk G on the cam-shaft H.

I represents an arm, secured to the whip-roll, provided with the adjustable curved arm I', which takes, at its outer curved end behind, a friction-roll, I², working on the upper end of the arm I³, adjustably connected to the weighted bell-crank I⁴, pivoted to the loom-frame at I⁵, and bearing, at the lower extremity, against the arm K of the vibrating support E of the worm-shaft, in such a manner as to have a constant tendency to separate the friction-wheel F from the disk G.

The operation of the mechanism thus far described is similar to that described in the aforesaid patent, granted to me, but the arrangement differs in the substitution of a weight for a spring, to bear the friction-wheel F away from the disk G, and the arrangement of the arms, or levers connecting the whip-roll with the vibrating frame E.

When the tension of the warp is sufficient to oscillate the whip-roll, the arms I and I', acting on the arm I³ and bell crank, will raise the latter, so that the spring L, connected to the said bell-crank, and bear-

ing against the arm K of the vibrating support of the friction-wheel F, will throw the latter against the disk G, which is constantly in motion, and which will communicate motion to the wheel F, to unwind the yarn from the beam, until the tension is overcome by the weight on the bell-crank I⁴, which will throw the friction-wheel out of gear with the disk, and thereby stop the delivery.

In the practical operation of this plan, as previously patented to me, I found, that under different conditions of the web, owing to atmospheric changes and other causes, that an increase or diminution of friction occurred between the surfaces of the friction-wheel and the disk, causing the yarn-beam at times to be carried too far, and the web thereby too much slackened.

To remedy this defect, I have introduced a second disk, G', on the cam-shaft, and on the opposite side of the friction-wheel F, against which the latter will be carried by the weight when the yarn is too much slackened, and be set in motion in the opposite direction, to wind the yarn on again, until the proper tension is attained, when the friction of the wheel F and disk G' will be overcome by the tension of the yarn. Under this arrangement, the tension of the warp will be influenced by the angle at which it is delivered from the beam, as is the case when the beam is set into rotation by the direct action of the warp.

To vary the tension of the warp, for the production of lighter or heavier goods, the arms I' and I³ have been made adjustable respectively, as described, on the arm I and the bell-crank I⁴.

To reduce the tension, the arm I' may be adjusted to a position nearer the whip-roll, and the arm I³ correspondingly elevated, which will give to the warp an increased leverage against the weight, while, if adjusted in the opposite direction, the advantage will be in favor of the weight, and the tension will be greater.

In the arrangement as previously patented to me, the friction-pulley was thrown into action with the disk by the positive action of a lever bearing against the arm K of the vibrating support of the friction-wheel. This arrangement, I have found to be objectionable, as it causes a severe blow of the friction-wheel on the disk, and also a sudden strain on the warp when first set into motion; and, to avoid this difficulty, I have interposed the spring L, above referred to, for moving the said friction-wheel into action with the disk, the action of which is sufficiently yielding to avoid the aforesaid objections.

To prevent "smashes," when the loom fails to "protect," as before referred to, I have provided the arrangement of the curved arm I' and friction-roll I² in the vertical arm I³, so arranged as to be disconnected by any sudden undue strain on the warp, as will occur if the shuttle does not "box," and the throwing-out mechanism fails, by which disconnection the whip-roll will relieve the warp of tension.

The end of the curved arm I', which takes under and behind the friction-roll, may be constructed of such a curve as will maintain the connection against the tension of the yarn while the loom is working properly, but which will instantly disconnect when any sensible or greater strain occurs, and the whip-roll may be made of a sufficient breadth to give the necessary relief to the yarn when brought down to a horizontal position.

This arrangement affords a means of instantaneously forming the connection again after the loom has been prepared to be set in motion, without requiring the operator to go behind the loom to wind on the yarn, as in the pace-rope let-offs, where a considerable amount will be delivered under like conditions.

Other arrangements may be made for accomplishing the winding on of the yarn again, without departing from the spirit of my invention; and I do not, therefore, limit my claim to this particular arrangement.

Having thus described my invention,

I claim as new, and desire to secure by Letters Patent—

1. The let-off mechanism arranged to wind on the surplus yarn let-off, and to govern the tension of the

warp by the winding-on devices, constructed substantially as and for the purpose described.

2. The combination, with the vibrating shaft actuating the yarn-beam, of the disks G and G', or their equivalent, arranged to actuate it alternately in either direction, substantially as and for the purpose set forth.

3. The combination of the curved adjustable arm I' and friction-roll I² with the arm I of the whip-roll and the arm I³ of the let-off mechanism, whereby relief is afforded the warp under an undue tension of the same, substantially as and for the purpose described.

4. The combination, with the whip-roll and the oscillating frame E, of the arm I, adjustable arms I' and I², and weighted bell-crank I⁴, substantially as and for the purpose set forth.

5. The combination, with the bell-crank I⁴ and the arm K, of the oscillating frame E of the spring L, substantially as and for the purpose set forth.

RENSSELAER REYNOLDS.

Witnesses:

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