

G. Draper.

Let-Off Mechanism for Loom.

Patented Jan 7, 1868.

N^o 72987

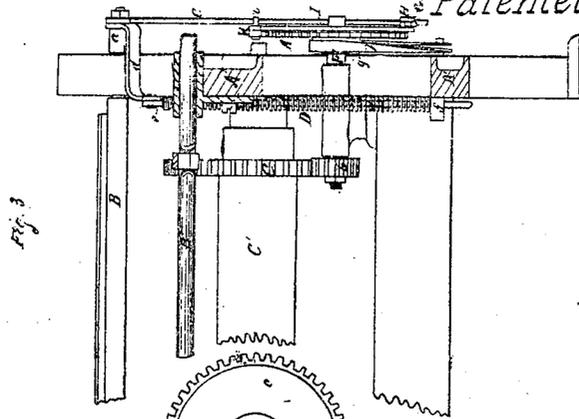


Fig. 3

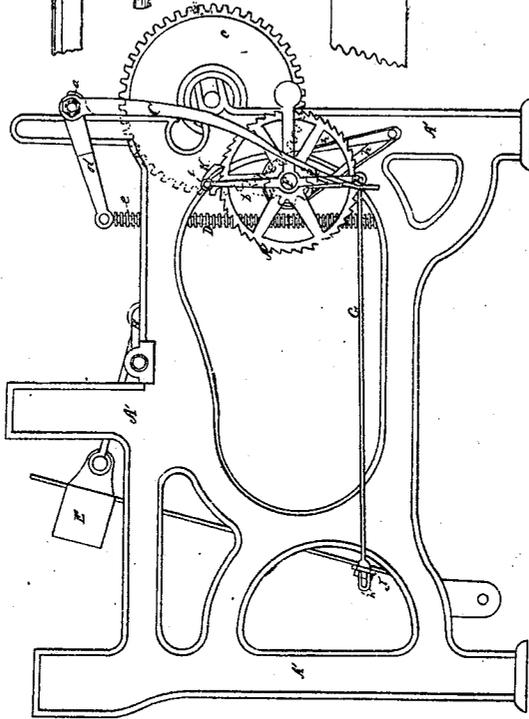


Fig. 2

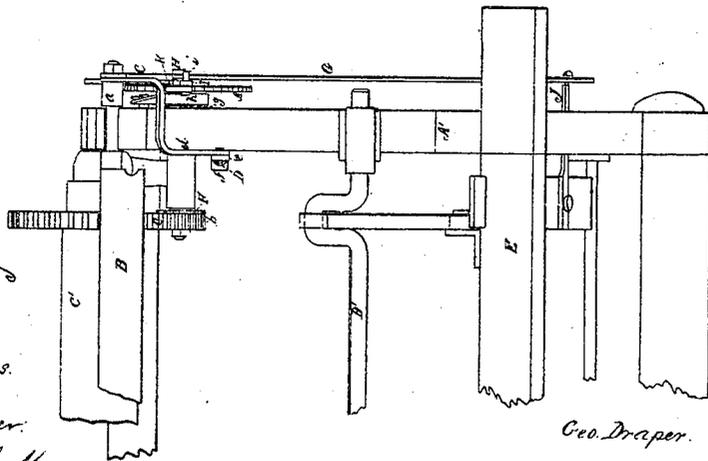


Fig. 1

Witnesses.

S. N. Piper.

James H. Miller.

G. Draper.

by his attorney.

R. W. Eddy.

United States Patent Office.

GEORGE DRAPER, OF MILFORD, MASSACHUSETTS.

Letters Patent No. 72,987, dated January 7, 1868.

IMPROVEMENT IN LET-OFF MECHANISM FOR LOOMS.

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

TO ALL PERSONS TO WHOM THESE PRESENTS MAY COME:

Be it known that I, GEORGE DRAPER, of Milford, in the county of Worcester, and State of Massachusetts, have invented a new and useful or improved Let-Off Mechanism for Looms for weaving cloth; and do hereby declare the same to be fully described in the following specification, and represented in the accompanying drawings, of which—

Figure 1 is a top view, and

Figure 2 an end elevation of a loom-frame and lay with my said let-off mechanism applied thereto.

Figure 3 is a vertical section, taken through the crank-shaft, and representing the yarn-beam and such of the let-off mechanism as is in the immediate vicinity thereof.

In such drawings, A' denotes the loom-frame; E, the lay; B', the crank-shaft for operating the lay; C' is the yarn-beam or roller on which the warps are wound.

The "let-off mechanism," to be hereinafter described, is understood to operate in connection with what is usually termed a "positive take-up motion or mechanism." Experience has demonstrated that cloth which requires much "beat" against the filling or weft, usually requires the "let-off mechanism" to be so constructed that the tension of the warp, while the reed of the lay is against the cloth woven, cannot operate to increase the amount of yarn delivered, or prepare the loom to afterward deliver more in consequence of the increased pressure on the warps. Experience has also proved that in weaving goods so thin that but little "beat" of the reed takes place, it is better to have the beat to help deliver the warp or to prepare for its delivery when the reed may be next against the cloth. In looms for weaving thick goods, the delivery of the warps should be regulated by the strain alone produced on the warps, and for those for weaving "thin" cloth, the delivery should be regulated by the beat and strain combined. When the delivery of the warp is governed by the beat of the lay and the tension of the warps, there will be less liability of production in the cloth of what weavers term "thick and thin places," but when the delivery of the warp is governed solely by the strain of the warp on the whip-roller, the tension will be more equable, for the reason the delivery will not take place during beat of the lay. It is very desirable to adapt the loom to the production of either a thin or a thick fabric, and my improved let-off mechanism, by a slight change or arrangement of one of its parts, will render the loom so applicable.

In carrying out my invention, I apply to one of the journals *a a*, of the warp-guide B, an arm or lever, C, to extend down in rear of the ratchet-shaft F, in manner as represented in the drawings. This shaft F carries a ratchet, A, and engages with the yarn-beam by a pinion, *b*, and a spur-gear, *c*, the former being fixed on the inner end of the shaft F, and the gear *c* being fixed to the yarn-beam concentrically with its axis. Another arm, *d*, projecting from the journal of the guide B, rests on the top of a helical spring, D, and is jointed to a rod, *e*, which goes down through the spring, and a bracket, *f*, upon and by which the spring is supported. A rocker-lever, I, carrying on its upper end an impelling-pawl, K, is arranged alongside of the ratchet A, and has the shaft F for a fulcrum, the pawl K engaging with the ratchet. Furthermore, on the shaft F is a wheel, *g*, around which a friction-band, *h*, is carried, such band being fastened to the loom-frame. To the lower arm of the lever I one end of a rod, G, is jointed, such rod, at or near its other end, being provided with a slot, *h'*, to receive an arm, J, projecting from the sword of the lay.

The operation of the mechanism, when adapted for the production of thick goods by the loom, may be thus described:

When the lay E is fully forward, the warp which passes from the beam over and rests upon the warp-guide B, cannot depress the guide, because such guide will be held stationary by the arm or lever C, which will bear against the head of the joint-pin H of the lever I, and rod G, the said pin H in turn being held stationary at such times by its connection with the lay through the rod G, and the arm J. Thus it will be seen that any amount of pressure or strain on the cloth cannot then change the position of the pawl K. The beam at such time will be kept stationary by the friction-band and wheel hereinbefore mentioned. But when the crank-shaft produces a recession of the lay, the arm J will be moved back in the slot *h'*. This will leave the warp-guide B to be sustained by the helical spring D, which may be supposed to present a given amount of resistance to a depression of the guide B. Should the strain on the cloth caused by the take-up mechanism be sufficient to overcome this resistance of the spring, the warp-guide B will be depressed, and the lever C will be forced against

the pin H, so as to move the lever I, and set back its pawl upon the ratchet. When the lay may next beat up, the arm J, by its draught on the rod G, will produce a movement of the lever I, such as will cause the pawl thereof to turn the ratchet, and thus effect a slight rotary motion of the yarn-beam, sufficient to effect the requisite delivery of the warp. In case the strain on the warp may not be sufficient to overcome the resistance of the spring D, and set back the pawl upon the ratchet, no rotary motion of the said ratchet will be produced.

In order to adapt the let-off mechanism to enable the loom to weave thin goods, the connecting-rod G should be removed from the pin H, and placed on a pin, *i*, at or near the upper end of the lever I. The operation of the parts of the let-off mechanism will now be very different from that hereto explained. Commencing with the lay back or at its furthest distance from the cloth, the pressure of the warp will be sustained by the spring D alone. The pawl K will be fully pressed back by the arm J, acting through the connecting-rod G. As the shaft may revolve, the lay will be pressed forward and the harnesses will open the warp. This, with the beat against the filling, and the action of the positive take-up motion, will produce an extra strain upon the warp, which, if sufficient, will cause the warp-guide to be depressed, and will set back the catch on the wheel A as before mentioned. When the lay next goes back, it, through the connecting-rod G, will cause the wheel A to revolve as before mentioned. The same results might be produced by putting a cam on the loom-shaft, so as to operate the pawl-lever I instead of the arm on the lay and the connecting-rod G, but I consider any such change a mere equivalent for the device or devices I have chosen to effect like results.

From the above it will be seen that I have combined, with the warp-guide, the lay, and the warp-beam and its gearing, mechanism which will not only hold stationary the warp-guide at the beat of the lay, without allowing such beat to then produce delivery of the yarn, but will also allow the strain on the warp to operate directly upon and so as to turn a ratchet applied to the driving-shaft of such gearing. This mechanism consists of the spring D and the arms *d* C, (applied to the loom-frames and the warp-guide B,) the friction-wheel and band, the lever I, its pawl K, the arm J, and the rod G provided with a slot, *h*.

It will also be seen that in this mechanism I do not use any worm or bevel-gears, such as are employed in the Bartlett and various other let-off mechanisms for operating the yarn-beam of a loom, and which render them costly and complicated.

What, therefore, I claim as my invention, is—

The said combination of devices, substantially as above described, for operating the said ratchet, the warp-guide, and beam in manner as specified.

And furthermore, I claim their combination with the warp-beam and its gearing, and ratchet, and with the warp-guide, and the lay, the whole being substantially as explained.

GEORGE DRAPER.

Witnesses:

R. H. EDDY,
F. P. HALE, Jr.