

George Smith's Improvement in Power Looms.

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Fig 1

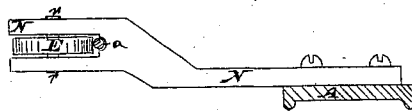
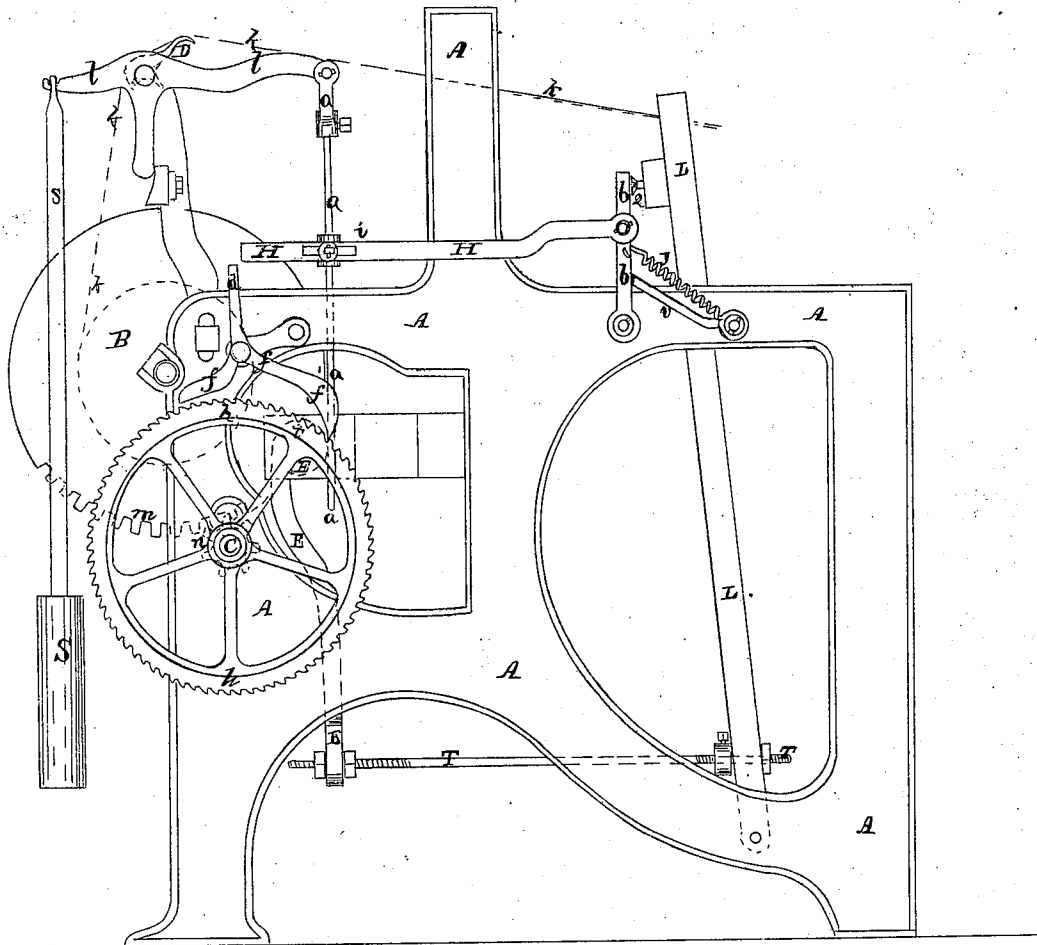


Fig 2.

Witnesses, *Leone A. Brunell*
Chas. Chace

Inventor, *George Smith*

UNITED STATES PATENT OFFICE.

GEORGE SMITH, OF CUMBERLAND, RHODE ISLAND.

IMPROVEMENT IN LET-OFF MOTION FOR LOOMS.

Specification forming part of Letters Patent No. 72,235, dated December 17, 1867; antedated December 11, 1867.

To all whom it may concern:

Be it known that I, GEORGE SMITH, of Cumberland, in the county of Providence and State of Rhode Island, have invented certain new and useful Improvements in Power-Looms; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings making part of this specification, in which—

Figure 1 is a side elevation of a power-loom arranged with my improvement. Fig. 2 is a detached view of the binder or brake hereinafter referred to.

Similar letters indicate corresponding parts in all the figures.

My invention relates to the means employed in connection with the mechanism for controlling the letting off of the warps, to bind and hold the warps rigidly at the moment that the lathe beats up to drive in the filling or weft; and consists in combining with the mechanism herein described for controlling the letting off of the warps, a binder or brake which at the most forward beat of the lathe, and while the connection is broken between the let-off mechanism and its source of motion, grips and holds the whip-roller and its connections rigidly and fixed in its last position at the moment the lathe beats against the filling for the purpose of relieving the let-off mechanism from the strain arising from this operation of the lathe.

To enable others to make and use my invention I will proceed to describe the same.

In the drawings, A represents the end framework of a loom. B is the yarn-beam. D is the whip-roller, and L is the lathe, all of which are of the usual construction and arrangement. The red line *k* represents the warp coming from the beam, passing over the whip-roller, and thence through the harnesses and the reed to the breast-beam and cloth-roller. According to a well-known method, the unwinding of the yarn from the beam is regulated by the toothed wheel *m* on the beam-head, which meshes with the pinion-gear *n* on the shaft *c*, and a ratchet-wheel, *h*, on the same shaft, with which the double detent or escapement *f* engages to hold the beam from turning except by casting off one tooth at a time at regular periods, as more yarn is re-

quired by reason of its being taken up in weaving. The whip-roller D is of the usual construction, and is provided with a lever, *l*, at one end, from the short arm of which depend the rod and weight *s*, which elevates the roller and produces the tension, and from the long arm of said lever depends a connecting-rod, *a*, which is made to slide vertically by any slight variation of the tension of the yarn that is sufficient to elevate or depress the whip-roller in the usual way. H is the tappet-bar or plunger, consisting of a horizontal rod or bar, hinged at one end to a rocker-arm, *b*, on a suitable stud projecting from the frame A. The other free end of said bar is attached to the connecting-rod *a* of the whip-roller by means of a stud-pin, *i*, on said rod, which passes through a slot in the bar to permit the bar to slide lengthwise, which movement in this case is derived from the swinging of the lathe, in which is fixed a set-screw, 2, the end of which at, or nearly at, the termination of the backward beat of the lathe strikes against the free end of the rocker-arm *b*, and give the bar H a short quick movement or impulse, as described. The bar and its rocker-arm are returned preparatory to repeating the impulsive movement by means of the spiral spring J, which holds it against the rest *v* while the lathe is completing its movement.

The detent or escapement is constructed with a tappet or arm, *d*, and it will be seen that the superior weight of the detent *f'* drops it into and holds it in one of the notches of the ratchet-wheel, and lifts the other detent out of said notches, in which position the end of the tappet *d* of the detent is in a line with the under side of the tappet-bar, and almost in contact with the end thereof, the two parts being, however, held from contact by the elevation of the whip-roller, and by the spiral spring J, which keeps the bar against the rest. Such, therefore, being the position of the tappet and the tappet-bar it will be readily seen that if the whip-roller be slightly depressed by excessive tension of the yarn the free end of the tappet-bar will also be depressed below the end of the tappet, so that when the tappet-bar is moved in the manner described by the backward beat of the lathe, the end of the tappet-bar will strike against or impinge the end

of the tappet *d*, and trip and lift the detent *f'* from the notches of the wheel, and the opposite detent will catch the next tooth until the detent *f'* is released and drops into the succeeding notch, by which operation the beam is allowed to turn slightly and let off the yarn, which reduces the tension, and the whip-roller is again elevated, and the tappet-bar is lifted out of the way of the tappet until, by continuing the weaving operation, the yarn is taken up and the tension again increased, when the operation just described is repeated, and so continues to do; and it will be readily understood that with this arrangement of parts the slightest appreciable depression of the whip-roll and the slightest impulse of the tappet-bar will produce the impingement of the bar and the tappet, and be sufficient to trip the detent and let off the yarn; and it is this peculiarity of arrangement in this mechanism which renders it so sensitive to any motion of the tension and so quick in its action to correct the same, and which constitutes my improvement. The means for controlling the letting off of the warps being thus materially improved, my invention is further directed to binding and confining the whip-roller in its position when the lathe beats up against the filling in order to prevent any variation of the tension from this cause. This is accomplished by means of the binder-lever or brake *E* hung on a pivot at *r* in a recess formed in a metallic block, *N*, attached to the frame *A*, as shown in Fig. 2.

The portion of the binder in the recess is in the form of an eccentric; and between its face and the end of the recess passes the connecting-rod *a* of the whip-roller, so that it is pinched and gripped when the lever swings in one direction, and is released and permitted to slide when swung in the opposite direction. The tail of this lever is connected, by the rod *T*, to the sword *L* of the lathe; and by the movements of the latter the lever is made to gripe the rod *a* at the extreme forward beat of the lathe, and thus to hold the whip-roller rigidly in position while the lathe beats up the filling, but at all other times the rod is liberated and free.

Having thus described my invention, I would mention that both the tappet-bar and the binder-lever may be operated, substantially in the manner described, from a cam on one of the shafts, or from some other moving part of the machine.

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

The combination of the mechanism for controlling the letting off the warps, as described, with a binder or brake for rigidly confining and holding the whip-roller in its latest position at the moment that the lathe beats up the filling, substantially in the manner described.

GEORGE SMITH.

Witnesses:

ISAAC A. BROWNELL,
JONA. CHACE.