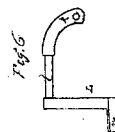
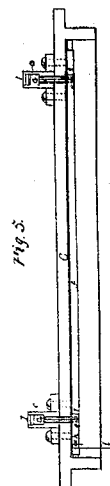
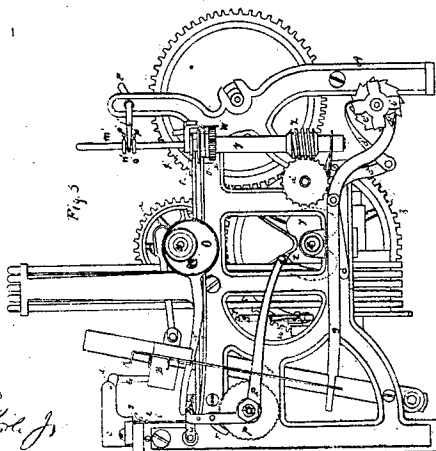
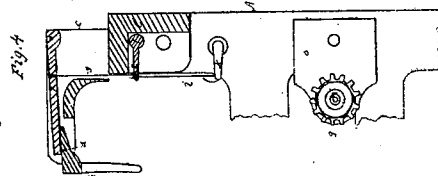
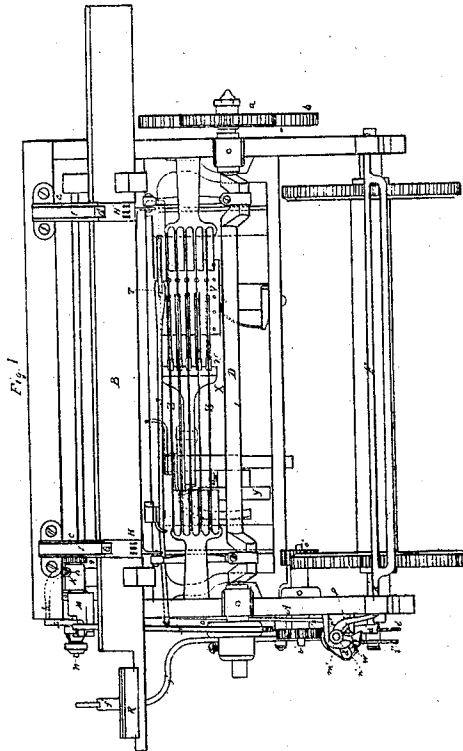
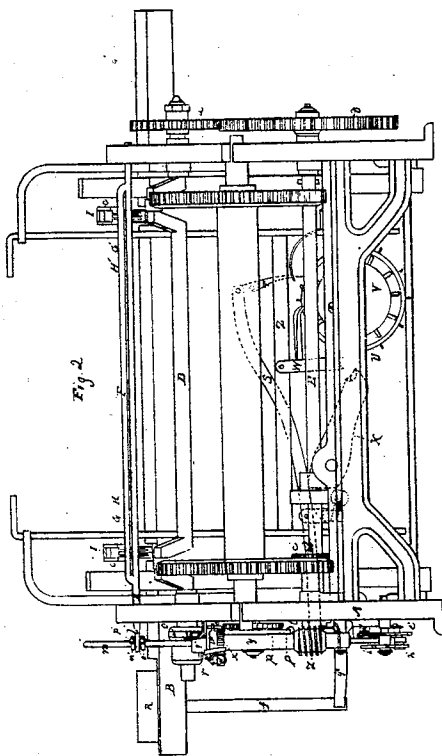


Jesse D. Cottrell.
Warp-Stop Mechanism in Looms.

N^o 89,561.

Patented May 4 1869.



Witnesses
J. P. H. J.
J. N. Piper

Inventor
Jesse D. Cottrell
by his attorney
R. H. Eddy

United States Patent Office.

JESSE D. COTTRELL, OF HOPEDALE, MASSACHUSETTS.

Letters Patent No. 89,561, dated May 4, 1869.

IMPROVEMENT IN WEFT-STOP MECHANISM IN 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, JESSE D. COTTRELL, of Hope dale, in the county of Worcester, and State of Massachusetts, have made a new and useful Invention, having reference to Looms for Weaving Cloth; and I 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,

Figure 2, a front elevation, and

Figure 3, an end view of the frame and sundry parts of a fancy loom, with my invention applied thereto.

The nature of my invention may be thus set forth, it consisting in the combination and arrangement of a separate lever, with the filling-fork, when such lever is combined with other mechanism for operating the shipper, such separate lever being for the purpose, among others, of preventing a shuttle, when, during its flight, it may be caught back of the fork, from causing breakage of the fork, as is liable to take place when the filling-fork is restrained from swinging forward.

Also, in the combination of a cammed arm, or its mechanical equivalent, applied to and so as to be operated by the filling-fork, substantially in manner as hereinafter described, with a shelf or bracket, a reciprocating pitman, and its eccentric or their equivalent, and with a bent lever applied to the harness-operative mechanism, the "take-up mechanism," the "let-off mechanism," and the "drop-box operative mechanism," or either of such mechanisms, substantially in manner as hereinafter described, the object of the said combination being, on the breakage of a weft-thread, during the throw of a shuttle, to so throw out of operation either or each of such mechanisms, that the beating of the lay caused by its momentum, after release of the shipper, shall not put in operation either or each of the said mechanisms, so as to require any resetting or readjustment of parts, before the next pick or throw of the shuttle can take place.

Also, in the arrangement of the tension-spring of the "whip-roller," or warp-guide, on the upright rod of such guide, and within the worm-shaft, and against a shoulder therein; such arrangement serving, not only to protect the spring from dust, or other accumulations, or injury, but enabling the spring to operate with friction, to prevent the worm-shaft from revolving out of time.

In the drawings—

A denotes the loom-frame.

B, the lay.

C, the breast-beam.

D, the lay-shaft.

E, the harness-cam shaft, and

F, the warp-guide, or "whip-roll," as it is frequently termed.

The two shafts D and E are connected by gears *a, b*.

On the breast-beam, and so as to project upward therefrom, are two standards *c c*, each containing a

filling-fork, G or G', which is a bent and furcated lever, having its longer arm arranged within and pivoted to the standard, the pin or pivot being as shown at *d* in fig. 4, which is a vertical section of the standard, the filling-fork, and the adjacent parts.

There is applied to the lay, in front of each filling-fork, one of two grids or racks, H H', of the kind ordinarily used.

Within each standard, and resting on the tail of the filling-fork thereof, is a separate lever, I, whose fulcrum is at or near its rear end.

The said lever I, by a rod, *g*, is connected with an arm, *e*, projecting from a rocker-shaft, *f*, arranged within the breast-beam, (see Figure 5,) which is an inner side view of the breast-beam and the mechanism connected therewith.

From the shaft *f* another arm, *h*, projects, and, by a rod, *i*, is connected with an arm, *k*, extending from a short shaft, *l*, arranged below the shaft *f*, and going through one of the end-parts of the loom-frame.

Both of the rods *g* and *i* are jointed to the respective parts with which they are connected.

From the outer end of the shaft *l*, the cammed arm L extends, over and upon a shelf or bracket, M, projecting from the loom-frame.

Figure 6 is a top view, and

Figure 7, a side elevation of the said cammed arm, it consisting of an arm provided with an inclined plane or cam, *m*, which is formed and extended from the arm, in manner as shown in the drawings.

A pitman, N, is arranged on the shelf M, and applied to an eccentric, O, fixed to the lay-shaft, such shaft, while in revolution, producing a reciprocating movement of the pitman, relatively to the shorter arm of a bent lever, P, which has for its fulcrum the main shaft *n* of the "take-up motion," or mechanism.

The said shaft *n* is supported in a bearing or bracket, *o*, and has fixed on it a ratchet, *p*, and a pinion, *q*.

An impelling-pawl, *r*, pivoted to the shorter arm of the lever P, rests on the toothed periphery of the ratchet, and serves, by the vibrations of the lever P, to actuate the ratchet, and, of course, the "take-up mechanism," which may be supposed to be of the ordinary kind, of which the ratchet and its shaft constitute a part.

In the drawings, three rods, *s t u*, are represented as jointed to the lever P, and extended from it.

The first of these rods, viz, *s*, is also jointed to the horizontal rocker-lever *v*, which carries the impelling-pawl *w* of the "let-off mechanism," such pawl being to operate against the ratchet *x* of the worm-shaft *y*.

A worm, or screw, *z*, on the shaft *y*, engages with a gear, *a'*, fixed on a shaft, *b'*, arranged and provided with a pinion, *c'*, as shown in the drawings.

The said ratchet *x*, lever *v*, pawl *w*, worm-shaft *y*, screw *z*, worm-gear *a'*, and pinion *c'*, constitute parts of a "let-off mechanism" in common use, the yarn-beam being supposed to be geared to the pinion.

The rod *t* is jointed to the lever *c'* of the draw-pawl *d'* of the ratchet *e'* of the drop-box operating mechanism.

The drop-box, shown at R, as applied to the lay, is supported by its arm *f'*, upon the longer arm of a lever, *g'*.

This lever is provided with a triangular cam, *h'*, which operates with a toothed wheel, *i'*, fixed on the shaft of the ratchet *e'*.

The lever P, while in movement, produces a corresponding movement of the said lever *e'*, whereby the draw-pawl *d'* will set in motion its ratchet, and thereby effect the movement of the drop-box.

The rod *u* connects the lever P with the lever S, which carries the impelling-pawl T.

This pawl operates the toothed wheel U of the toothed drum V, by which the set of levers W, connected with the harness-carriers Z Z, &c., are operated; in order to effect the necessary changes of the harnesses, as may be required during the process of weaving.

The lifter-lever, which acts in connection with the set of levers W, is shown at X, and its operative cams at Y, these latter being fixed on the shaft E. This apparatus, for operating the harnesses, is well known.

From the shaft *k* of the warp-guide, or whip-roller, an arm, *l*, extends to a vertical rod, *m'*, the rod being passed through the arm, and provided with adjustable collars *n'* *o'*, one of which is above, and the other below the arms.

Each of the said collars is furnished with a set-screw, *p'*, to enable the collar to be clamped to the rod.

The rod *m* carries the sector *q'*, by which the impelling-pawl *w* is kept out of action upon the ratchet *x*.

The said sector, fixed to the rod *m'* by a set screw, is adjustable vertically on the rod, and rests on the top of a shelf or bracket, *r'*.

The rod passes through the bracket, and extends down within the worm-shaft *y*, which is tubular.

A helical spring, *s*, (see Figure 8, which is a section of the worm-shaft,) envelops that part of the rod which is within the worm-shaft, and the said spring rests on a foot, *t'*, fixed to the lower part of the rod.

The upper end of the spring bears against a shoulder, *u'*, at the upper part of the worm-shaft.

By pressing against the shoulder, the spring keeps the worm-shaft from revolving out of time.

This application of the spring saves the necessity of employing the friction-pulley and band, generally used with the "let-off mechanism."

The belt-shipper is to be so arranged that, while the shorter arm of the lever P is in the act of being moved backward by the pitman, such arm or a projection from it shall be forced against the shipper, so as to throw it off its retaining-shoulder and set it free in order that it may spring and shift the driving-belt from the fast to the loose pulley.

From the above, it will be seen that while the weft, during a throw of the shuttle, may remain unbroken, it will lie against one of the grids or racks of the filling-forks, so that, when the lay may beat up, the weft, resting against the grid, will, by its action against

such filling-fork, force it back, or cause it to turn and effect the elevation of the cammed arm L.

This will enable the pitman N, during its advance, to pass directly underneath the cam *m* of the said arm, and meet and move the lever P, so as to actuate each of the various mechanisms connected therewith.

But should the weft-thread, during a throw of the shuttle, not remain intact, or become broken, neither of the filling-forks will be actuated by it, when the lay beats up.

Consequently, the cammed arm L will remain down upon its bracket or shelf, and the pitman, in advancing, will meet and pass up the cam *m* of the said arm, and over the top of the upright arm of the lever P.

Thus, under these circumstances, no movement of such lever, or the various mechanisms connected with it, will be produced, although the lay may continue to move after the shipper may have been set free, so as to cast the driving-belt of the loom off the driving-pulley and upon the loose pulley.

The next time, the weft may be properly thrown across the race-beam of the lay, the harness-mechanism, the take-up mechanism, and the let-off mechanism will be again properly thrown into operation, and without the necessity of any adjustment of the harnesses, by the attendant, in order to bring the right ones into action, to prevent irregularity of weaving of the figure or figures.

I claim the filling-fork G as constructed, not only as a bent and furcated lever, supported on a pivot, or fulcrum, *d*, as described, but as disconnected from and with its horizontal arm disposed underneath and against an arm, or lever, I, combined with mechanism as explained, or its equivalent, for operating the shipper, the whole being substantially specified and represented, and to enable the filling-fork, when a shuttle, during its flight, may be caught in the warp and borne against the backs of the prongs of the fork, to move, so as to allow the shuttle to pass it without causing breakage of the fork or any part of the mechanism for actuating the shipper.

I also claim the combination of the cammed arm L, or its mechanical equivalent, applied to, and so as to be operated by the filling-fork, in manner and by means substantially as described, with the shelf, or bracket M, the reciprocating pitman N, and its eccentric O, or their equivalent, and with the bent lever P, applied to the harness-operative mechanism, the "take-up mechanism," the "let-off mechanism," and the "drop-box operative mechanism," or either of the said mechanisms, substantially in manner as specified.

I also claim the arrangement of the tension-spring *s'*, of the "whip-roller," or "warp-guide," on the upright rod *m'* of such guide, and within the worm-shaft *y*, and against a shoulder, *n'*, therein, the whole being substantially as, and to effect advantages as hereinbefore explained.

JESSE D. COTTRELL.

Witnesses:

WM. F. DRAPER,
GEORGE DRAPER.