

J. BULLOUGH, Dec'd.  
J. A. WARE, Adm'r.

Stopping-Mechanism for Looms.

No. 159,984.

Patented Feb. 16, 1875.

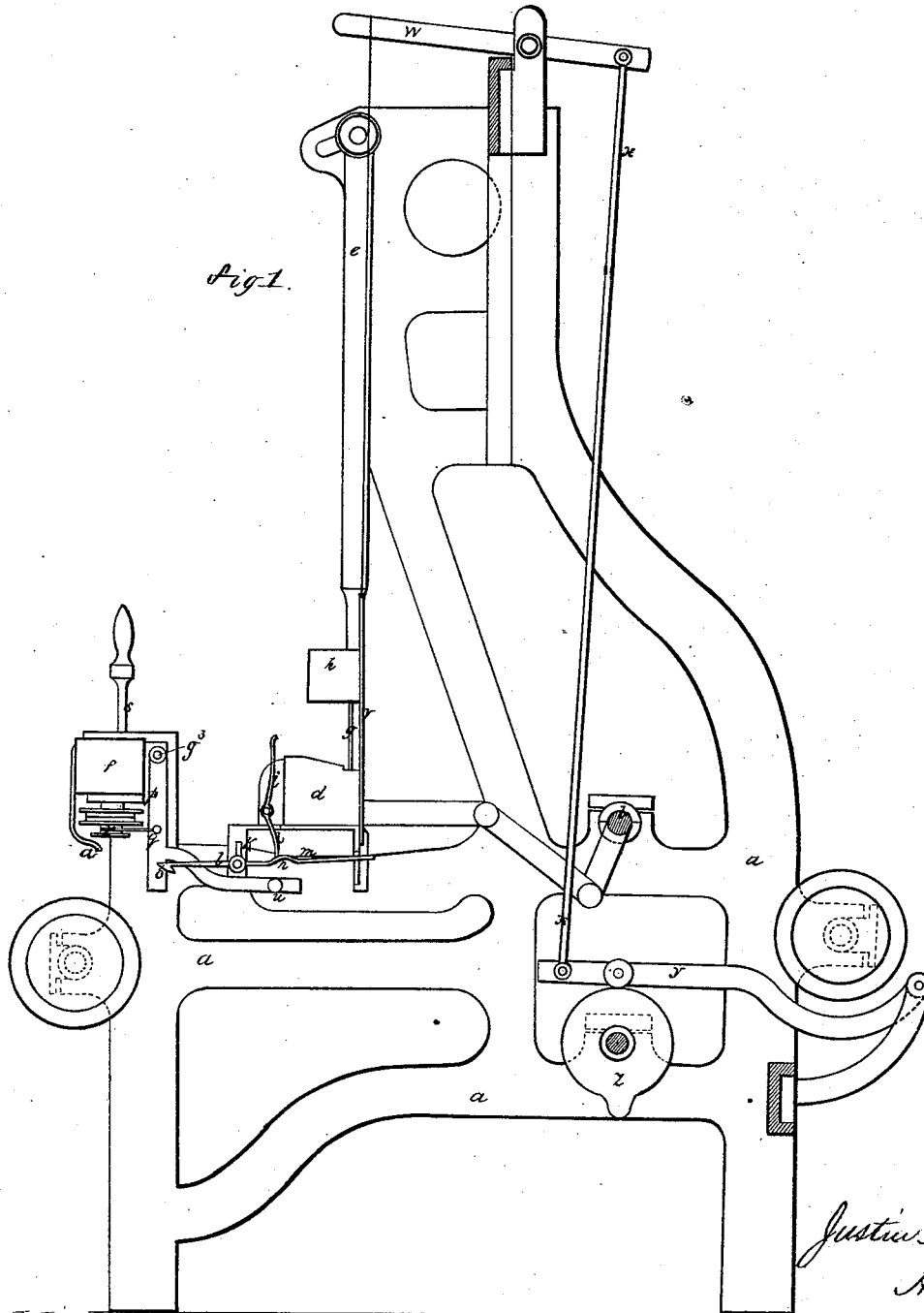


Fig. 1.

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Fig. 2.

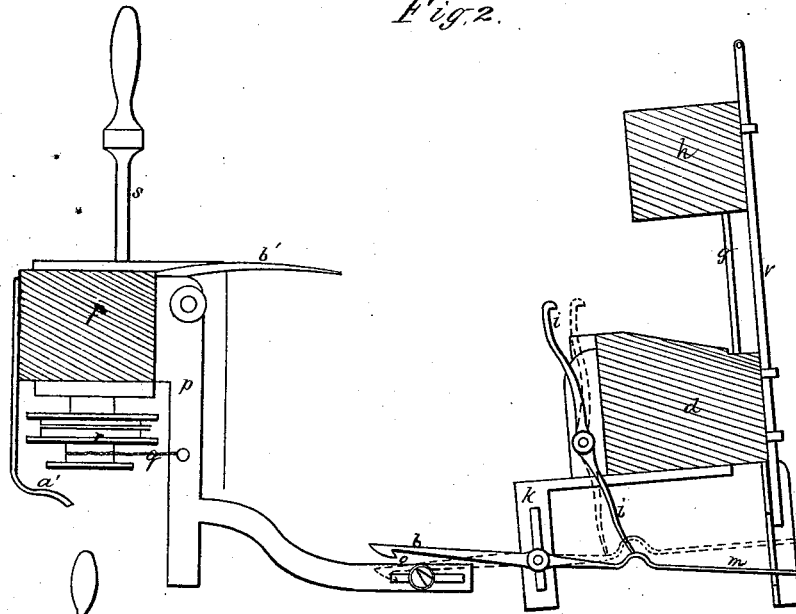
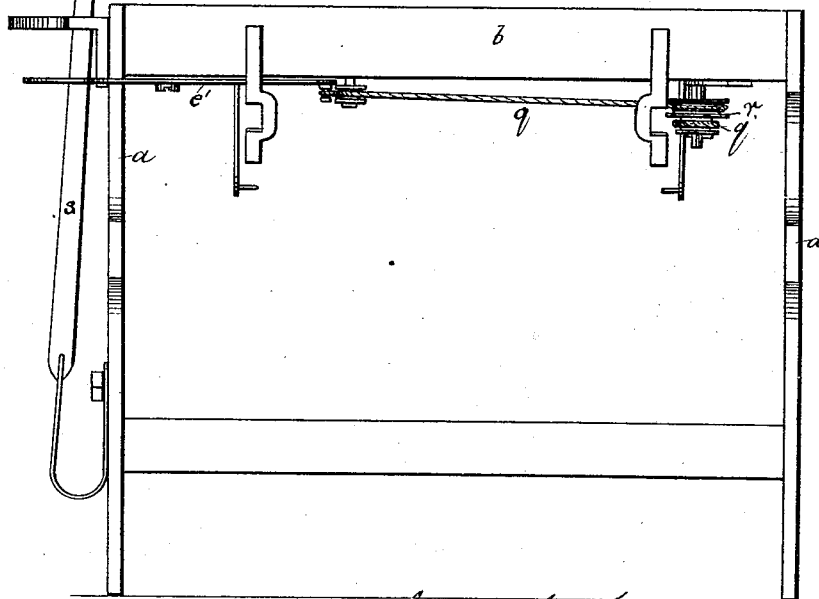


Fig. 3.



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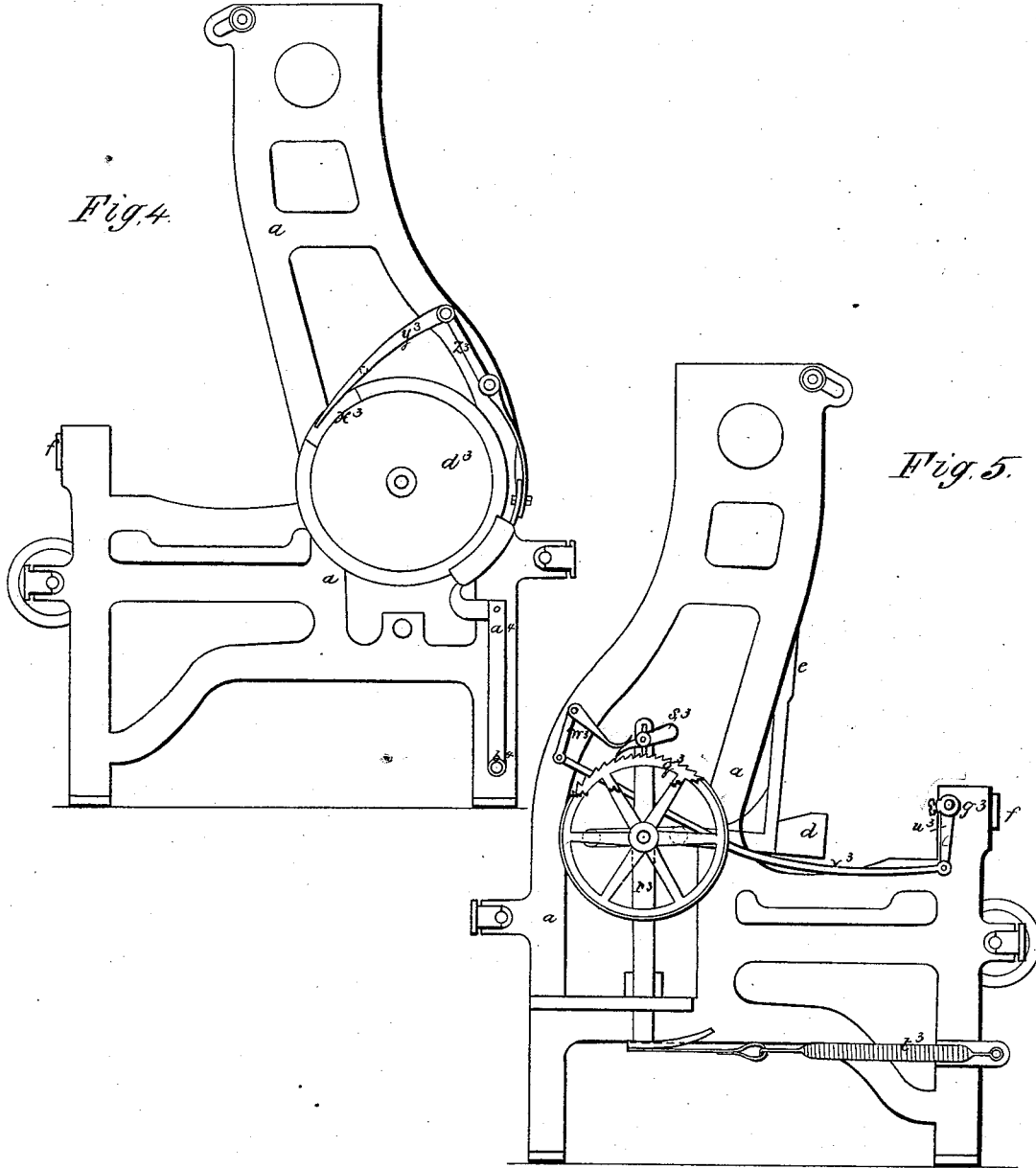
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# UNITED STATES PATENT OFFICE.

JUSTIN A. WARE, OF WORCESTER, MASSACHUSETTS, ADMINISTRATOR OF  
JAMES BULLOUGH, DECEASED; SAID ADMINISTRATOR ASSIGNOR TO  
GEORGE CROMPTON, OF SAME PLACE.

## IMPROVEMENT IN STOPPING MECHANISMS FOR LOOMS.

Specification forming part of Letters Patent No. **159,984**, dated February 16, 1875; application filed  
December 14, 1874.

### CASE B.

*To all whom it may concern:*

Be it known that JAMES BULLOUGH, deceased, late of Baxenden, near Accrington, in the county of Lancaster, England, did invent Improvements in Looms for Weaving, of which the following is a specification:

This invention consists in an improved weft-stopping motion for stopping the loom when a weft-thread breaks or is absent.

In this arrangement a pin or lever is placed on a stud at the front of the lay at both sides of the warp, the said pins or levers projecting a short distance above the race-board of the lay. On brackets fixed to the bottom of the lay there are studs carrying two-armed levers for actuating the shipping or stopping mechanism. Each lever has an incline on the back arm, and the forward end of the front arm is adapted to move the shipping devices, and the lower ends of the pins or levers rest on the inclines of the back arms.

The shipping mechanism consists of levers supported by brackets fixed to the breast-beam, and connected by a chain, cords, or rods to the stopping or setting-on rod, and adapted to be operated, when required, by the above-mentioned levers carried by the lay.

When the shuttle is being thrown across the lay, and there is no breakage or absence of weft, the upper of one or other of the pins or levers comes in contact with the weft, and enables the lower part of the pin or lever, when the lay is going back, to act upon one of the inclines of the first-mentioned levers, and raise its opposite end so that no stoppage of the loom takes place; but, if there is a breakage or absence of weft, the pins or levers remain stationary, out of the way of the inclines, and, therefore, one or the other of the ends of the levers below the lay operates one or the other of the levers on the breast-beam, and gives motion to the chains, cords, or rods connected to the stopping or setting-on rod, and stops the loom. In some cases one pin or lever, and parts connected with it, may be employed at one side only of the warp.

When pins or levers are used at both sides, one should be worked at every other pick to prevent the unnecessary stoppage of the loom, and for this purpose tappets on the tappet-shaft are employed for acting, by means of levers and rods, on the levers connected to the lay.

This invention will be clearly understood by the following particular description thereof, reference being had to the figures on the accompanying two sheets of drawings, and to the letters of reference marked thereon.

Figure 1 is a transverse view of a loom, showing the improved weft-stopping mechanism. Fig. 2 is a partial transverse section of the same drawn to an enlarged scale; and Fig. 3 is a front view of the loom, showing the stopping-mechanism.

In the figures, *a* represents, in whole or in part, the end frame of the loom; *b*, the crank-shaft; *c*, the tappet-shaft; *d*, the lay or batten; *e*, the lay-swords; *f*, the breast-beam; *g*, the reed, and *h* the reed-cap.

In the arrangement shown in Fig. 1, there is placed on a stud, at the front of the lay *d*, at both sides of the warp, a pin or lever, *i*, the top of which projects a short distance above the race-board of the lay. To the bottom of the lay are fixed brackets *k*, each holding a stud, carrying a two-armed lever, *l m*, having an incline and catch, *n*, on the back arm *m*, and a hook, *o*, at the front end of the front arm *l*, and the bottom end of each pin or lever *i* is in contact with one of the back arms *m*. On studs in brackets fixed to the breast-beam there are other levers *p*, each connected by a chain or cord, *q*, to the smaller diameter of a double pulley, *r*, working on a stud at the bottom of the breast-beam *f*, there being fixed to the larger diameter of the pulley another chain or cord, which passes over a guide-pulley, and is connected either directly or by means of a lever, *e'*, to the stopping-on or setting-on rod *s*, and at the lower end of each lever *p* there is a catch, *u*, which can be seized by the hook *o*, when there is a

breakage or absence of weft. The front arm  $l$  of the two-armed lever is heavier than the back arm  $m$ , and the back arm can be depressed by the vertical rod  $v$ , connected to one end of the lever  $w$ , having its other end jointed to the rod  $x$ , jointed to the lever  $y$ , carrying a bowl in contact with the single tappet  $z$  on the tappet-shaft  $c$ , and the two tappets, one at each side, are placed in opposite directions for the purpose of raising the hooked arms  $l$  at every other pick—that is, for raising each arm at the opposite side from which the last pick is thrown when pick and pick are given from each side alternately. To the breast-beam are fixed two inclines or curves,  $a^1$ , one for each two-armed lever,  $l m$ , for the purpose of raising the hooked arms, and depressing the back arms, and releasing the bottom ends of the pins or levers  $i$  from the catches and inclines  $n$ , there being thin brackets  $b^1$ , fixed to breast-beam  $f$ , for raising the cloth to allow the tops of the pins  $i$  to pass under when the pick of weft is beaten up, the catches in the inclines  $n$  and the curves or inclines  $a^1$  may be dispensed with, when desired.

As the lay proceeds from the front to the back center the back of the two-armed lever  $l m$ , on the opposite side from which the pick was given, is depressed by means of its corresponding tappet  $z$ , levers  $w y$ , and rods  $v x$ , in connection with it, for the purpose of raising the hook  $o$  above the catch  $u$ , and preventing the loom from being stopped unnecessarily.

As the lay proceeds the shuttle is being thrown across, and if there is no breakage or absence of weft the upper part of the pin or lever  $i$ , on the side from which the pick was given, is pushed back by the weft, and the lower part of the pin or lever pushed on the incline  $n$  into the catch, so as to raise the hook  $o$ , and prevent it from seizing the catch  $u$  on the lever  $p$  and stopping the loom; but if there is a breakage or absence of weft, the top of the pin or lever  $i$  remains stationary, and leaves the bottom of the pin away from the incline, as shown by the dotted lines, Fig. 2; and as no action is given to the two-armed lever  $l m$ , the hook  $o$  on the front arm seizes the catch  $u$ , pulls forward the lever  $p$  and chain  $g$ , which turn the pulleys  $r$ , and shift the stopping and setting-on rod  $s$  out of its detent, and stops the loom at or about the back center.

In the foregoing arrangement of improved weft-stopping motion, when there is a breakage or absence of weft, the stopping or setting-on rod is shifted out of its detent as the lay is going back, thereby enabling the loom to be stopped at or near the back center; but for causing it to be stopped with certainty, there is employed at one end of the loom a catch and catch-wheel, and parts connected with them; and placed at the other end of

the loom is a reaction-brake, as shown in Fig. 4.

The crank-shaft  $b$  is provided with the ordinary fast and loose pulleys, the fast pulley having fixed to it the catch or ratchet wheel  $q^3$ .

On the crank-shaft there is a loose vibrating bar or lever,  $r^3$ , to the upper part of which is jointed the weighted catch  $s^3$ , and to its curved bottom is fastened a strap, connected to one end of the strong spring  $t^3$ , held at its other end to a bracket fixed to an end frame of the loom.

To the shaft  $g^3$  on the breast-beam is fixed the lever  $w^3$ , connected, by the rod  $v^3$ , to the arm  $w^3$  of a double lever, the other arm of which rests on the catch  $s^3$ . At the other end of the loom, on the fly-wheel  $d^3$ , is fixed a projection,  $x^3$ , and a catch,  $y^3$ , provided, at its inner side with a pin to bear on the wheel, is jointed to the lever  $z^3$ , held loosely by a screw or stud to the back of another lever,  $a^4$ , working on the fulcrum  $b^4$ , and having leather or other friction material in contact with the periphery of the wheel.

When the shaft is slightly turned for stopping the loom the lever  $w^3$  is moved back, and the rod  $v^3$ , by means of the lever  $w^3$ , passes the catch  $s^3$  into the teeth of the catch or ratchet wheel  $q^3$ , and thereby causes the wheel to give vibrating motion to the bar or lever  $r^3$ , and stretch the strong spring  $t^3$ , the resistance of which stops the forward movement of the lay without any shock or concussion.

The resistance given to the forward movement of the catch-wheel has a tendency to cause it to recoil; and it is to prevent the recoil from proceeding too far that the reaction-brake is employed, and the projection  $x^3$  on the wheel placed in such a position that the catch  $y^3$  shall hold the projection and wheel before the crank recoils beyond the back center.

In those looms in which jacquard apparatus, dobbies, or pattern-chains are employed for opening and closing the shed, it is well known that it is of great importance that the shed through which the last pick was thrown should remain open when the loom is stopped by the weft-motion, in order to prevent the pattern cords or chains from overcoming the pattern of the fabric, and that is the main object for stopping the loom at or about the back center when the shed is open, and preventing the crank from turning to the top center when the shed would be closed.

I claim as the invention of the said JAMES BULLOUGH—

1. The combination, with the lay, of a pivoted lever or pin, projecting therefrom above the race-board, and adapted or arranged to be turned by the weft to prevent the stopping of the loom, substantially as described.

2. The combination, with the lay and its

attached lever for actuating the shipping or stopping mechanism, of a rod and lever to move such lever for actuating the shipping mechanism, substantially as described.

3. The combination, with the lay and its attached lever *i*, adapted to be tilted by the weft, of a lever pivoted to the lay and adapted to operate the belt-shipping mechanism when the weft fails, substantially as described.

4. In combination, the lever *p*, chains or cords *q*, pulley *r*, lever *e*<sup>1</sup>, and setting-on rod *s*, substantially as described.

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Witnesses:

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