

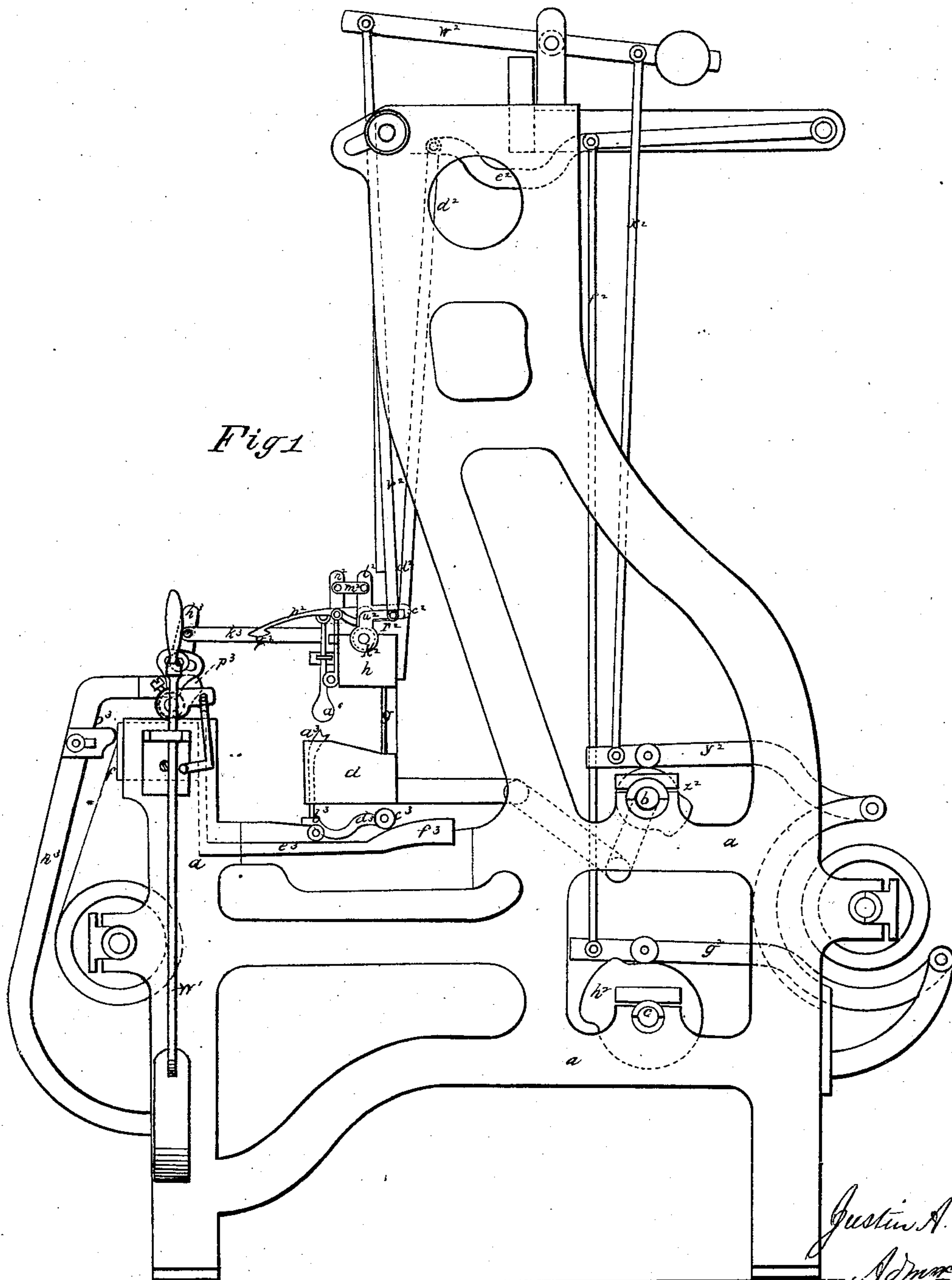
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Stopping-Mechanism for Looms.

No. 159,986.

Patented Feb. 16, 1875.



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Fig. 2.

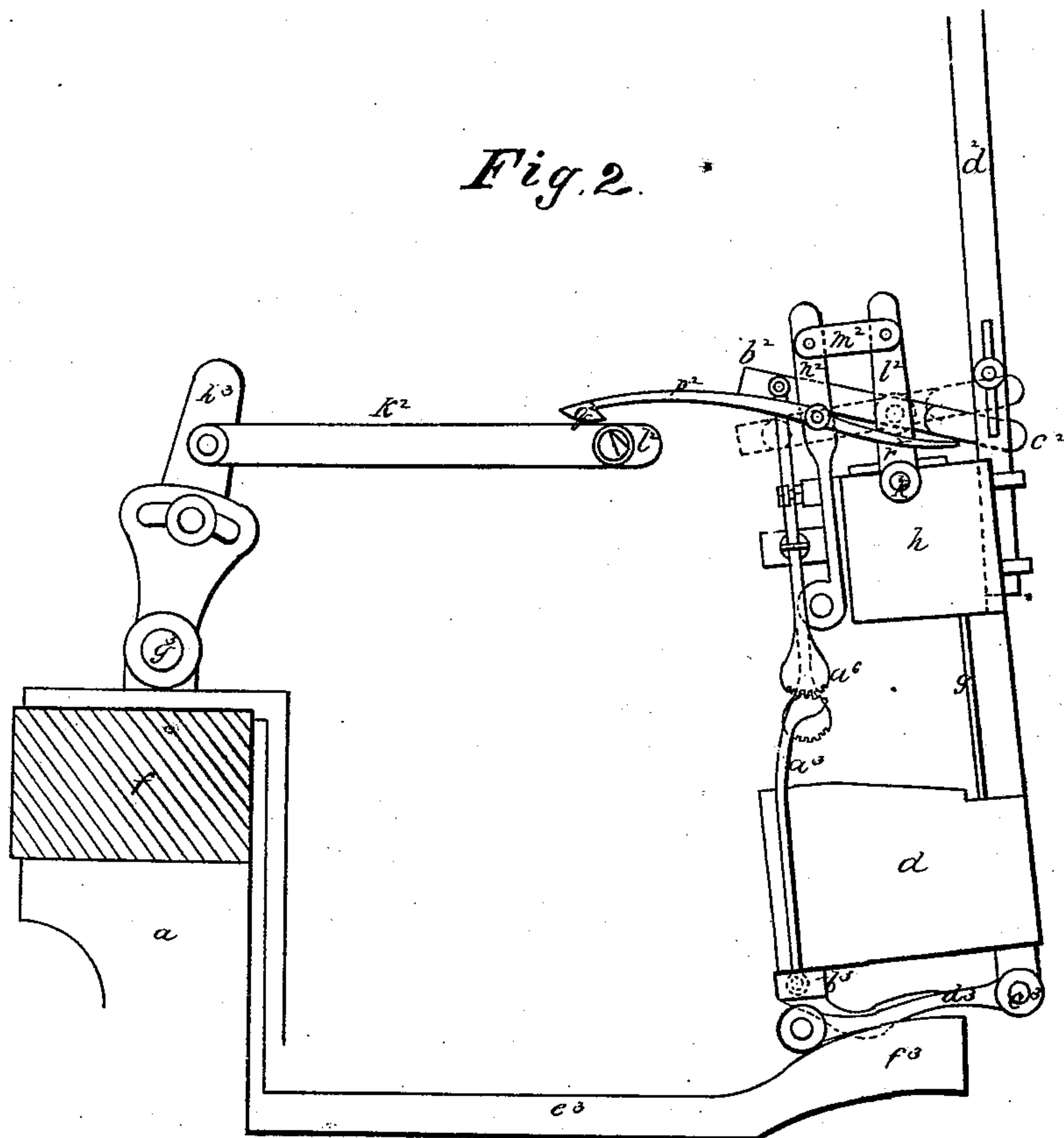


Fig. 3.

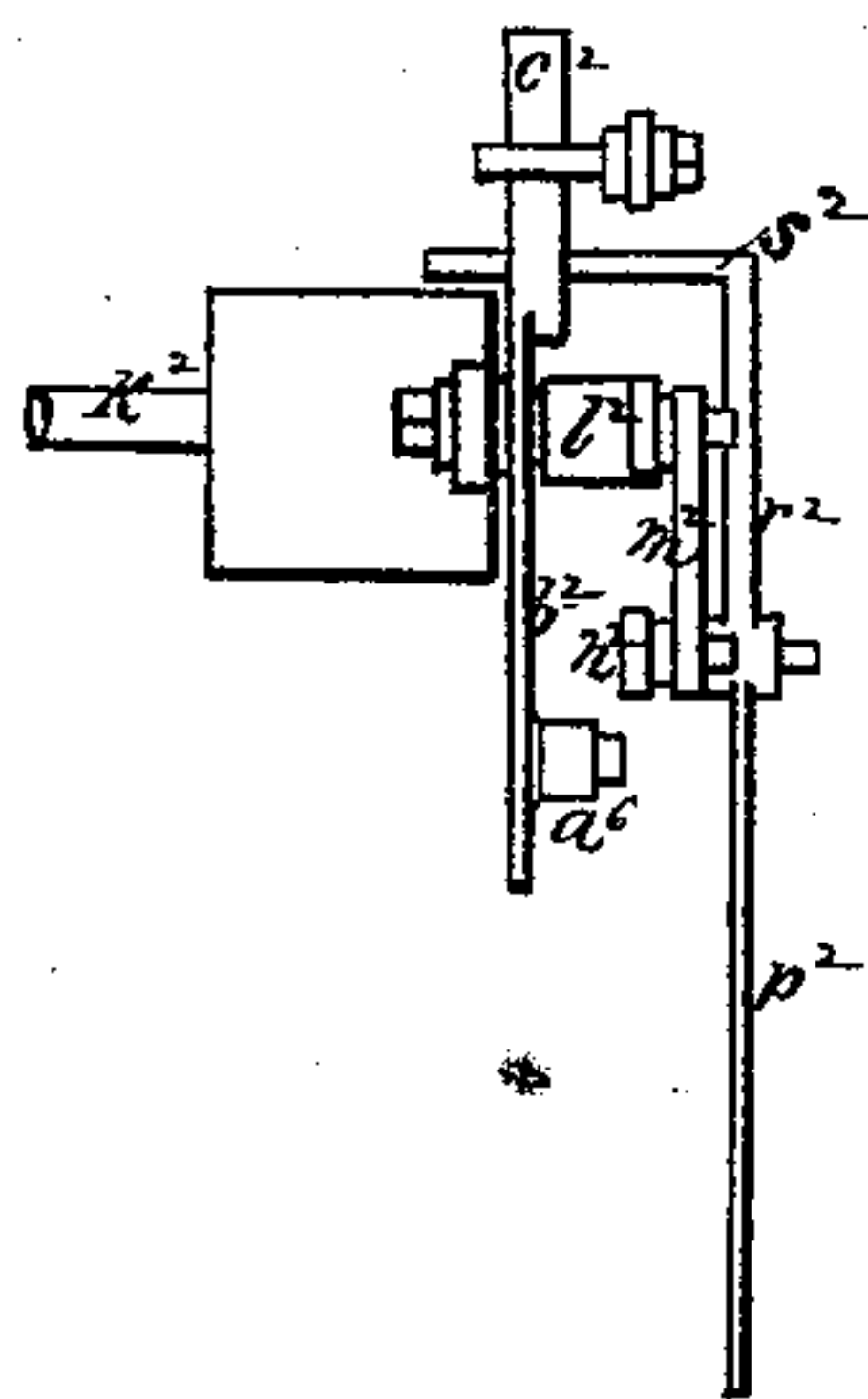


Fig. 4.



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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. **159,986**, dated February 16, 1875; application filed  
January 11, 1875.

### CASE D.

*To all whom it may concern:*

Be it known that JAMES BULLOUGH, deceased, late of Baxenden, near Accrington, in the county of Lancaster, England, invented 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 invention weft-feelers are projected within the shed, and feel for the weft, supported by forks, which are also inserted within the shed, as hereinafter described. On the lay is placed a shaft, extending from one end to the other, and fixed to the shaft is a lever or arm, which carries a lever that actuates the feeler. This feeler carrying or moving lever is adapted to move the lever that actuates the shipping mechanism, and when the weft is present the shipping mechanism is left undisturbed, but when the weft is broken or absent the lever which actuates the shipping mechanism is allowed to move into position to actuate such mechanism and stop the loom.

In the drawings, Figure 1 represents an end view of a loom provided with my invention. Fig. 2 is an enlarged sectional detail. Fig. 3 is a partial front view, and Fig. 4 is a view of the feeler and fork.

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.

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. The weft-feelers are vertical rods, widened and notched at the bottom, and placed at any suitable distance from the center of the warp. One of the said feelers is shown at *a*<sup>6</sup>. It is jointed at top to the front arm *b*<sup>2</sup> of the lever or arm *l*<sup>2</sup> of shaft *k*<sup>2</sup>, mounted on the reed-cap *h*. The back arm *e*<sup>2</sup> of the said double lever can be

depressed, when required, by a stud fixed to the rod *d*<sup>2</sup>, connected to the lever *e*<sup>2</sup>, which is also jointed to the rod *f*<sup>2</sup>, connected to the lever *g*<sup>2</sup>, having a bowl in contact with a single tappet, *h*<sup>2</sup>, on the tappet-shaft *c*, the projection of the two tappets being placed in opposite directions, for enabling the two feelers *a*<sup>6</sup> alternately to enter the warp at the required times. In bearings on the top of the reed-cap there is a shaft, *k*<sup>2</sup>, extending from end to end, and to this shaft is fixed the lever *l*<sup>2</sup>, jointed, by a link, *m*<sup>2</sup>, to the lever *n*<sup>2</sup>, working on a stud in a bracket fixed to the front of the reed-cap *h*. To this lever is jointed a double lever, having a front arm, *p*<sup>2</sup>, with a hook, *q*<sup>2</sup>, at the front, and a back arm, *r*<sup>2</sup>, with a projecting side piece, *s*<sup>2</sup>, Fig. 3, in contact with the under side of the back arm *c*<sup>2</sup>, and the back of the lever *n*<sup>2</sup> is in contact with a spring partially embedded in the front of the reed-cap. To one end of the shaft *k*<sup>2</sup> is fixed another lever, *u*<sup>2</sup>, connected to the rod *v*<sup>2</sup>, jointed to one arm of the lever *w*<sup>2</sup>, jointed to the rod *x*<sup>2</sup>, connected to the lever *y*<sup>2</sup>, having a bowl in contact with a single tappet, *z*<sup>2</sup>, on the crank-shaft *b*, or a double tappet on the tappet-shaft *c*. Below the widened end of each weft-feeler *a*<sup>6</sup> there is a fork, *a*<sup>3</sup>, Figs. 1, 2, and 4, the shank of which passes through a groove in the front of the lay, and is held to a lever, *b*<sup>3</sup>, fixed to a shaft, *c*<sup>3</sup>, working in bearings at the bottom of the lay. To the shaft *c*<sup>3</sup> is fixed another lever, *d*<sup>3</sup>, having a bowl, which rides on an arm, *e*<sup>3</sup>, having a curve or incline, *f*<sup>3</sup>, so that as the lay moves to and fro the lever *d*<sup>3</sup> shall move up and down, and with it the levers *b*<sup>3</sup> and forks *a*<sup>3</sup>. On the breast-beam *f* there is a shaft, *g*<sup>3</sup>, carrying a lever, *h*<sup>3</sup>, and arm *k*<sup>3</sup>, and catch *l*<sup>3</sup>, and also lever *i*, in connection with the stopping or setting-on rod *s*; and when the catch *l*<sup>3</sup>, arm *k*<sup>3</sup>, and lever *h*<sup>3</sup> are pulled back by the hook *q*<sup>2</sup>, the stopping or setting-on rod *s* is pushed out of its detent, and stops the loom in the usual way.

When the lay is moving to the front center, and until the beat-up is completed, the two



feelers are held up out of the warp by the hollows of the tappets  $h^2$ .

When the lay is moving from the front to the back center the forks  $a^3$  rise as the bowls on the lever  $d^3$  ride on the curve or incline  $f^3$ , in order to catch and support the weft, and the feeler opposite to the side from which the pick is given is also held up during the backward movement of the lay; but on the side on which the pick is given the bowl on the lever  $g^2$  is on the projection of its corresponding tappet  $h^2$ , thereby enabling the rods  $f^2$  and  $d^2$  to be raised, so as to allow the front arm  $b^2$  to fall and lower the feeler into the warp to feel for the weft, and if there is a weft on the fork  $a^3$  the feeler rests upon it, and keeps down the back arm  $c^2$ , and maintains the hook  $q^2$  above the catch  $l^3$ , thereby preventing the stoppage of the loom; but if there is a breakage or absence of weft, the feeler, not being supported, falls lower, and raises the back arm  $c^2$  away from the back arm  $r^2$ , thereby allowing the heavier hooked arm  $p^2$  to fall by its own gravity, so that as the lay is moving to the back center the hook  $q^2$  can seize the catch  $l^3$ , pull the arm  $l^3$ , and shift the stopping or setting-on rod out of its detent and stop the loom.

In some cases, according to the width of the fabric, only one of the weft-motions (shown in Figs. 1 and 2) is employed and placed in the center of the warp; but this motion will have to be worked at every pick by a single tappet on the crank-shaft or a double tappet on the tappet-shaft, and when the shaft on the breast-beam  $f$ , Figs. 1 and 2, requires to be stayed in the center to resist the pull, there may be fixed to the front rail of the loom a bracket,  $n^3$ , Fig. 1, having an adjustable piece,  $o^3$ , in contact with the cloth on the breast-beam, and a projection,  $p^3$ , in contact with the inner surface of the shaft.

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.

I claim as the invention of the said JAMES BULLOUGH—

1. The combination, with the lay, of a weft-feeling device composed of two movable parts adapted to operate within the shed, one part serving to place or hold the weft in position while the other part feels for the weft, substantially as described.

2. A weft-feeling device composed of two movable parts, and working within the shed between the selvages, combined with mechanism to withdraw the feelers from the shed when the lay beats up, substantially as described.

3. The combination, with the lay, of a weft-supporting fork, adapted to be projected above the lay and among the warps, and to support the weft against the action of a feeler, adapted to feel for the weft, substantially as described.

4. The combination, with the lay, of weft-feeling devices, adapted to be projected into the shed and bear on opposite sides of the weft, substantially as described.

5. The combination, with the lay, of the movable weft-fork, notched and adapted to be projected within the shed and to support the weft, substantially as described.

6. In combination, the lay, the two movable weft-feeling devices, adapted to be projected within the shed, and to bear on opposite sides of the weft, and a lever for moving the shipping mechanism to stop the loom, the arm being moved by the weft-feeler when the weft is absent, substantially as described.

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