

No. 620,465.

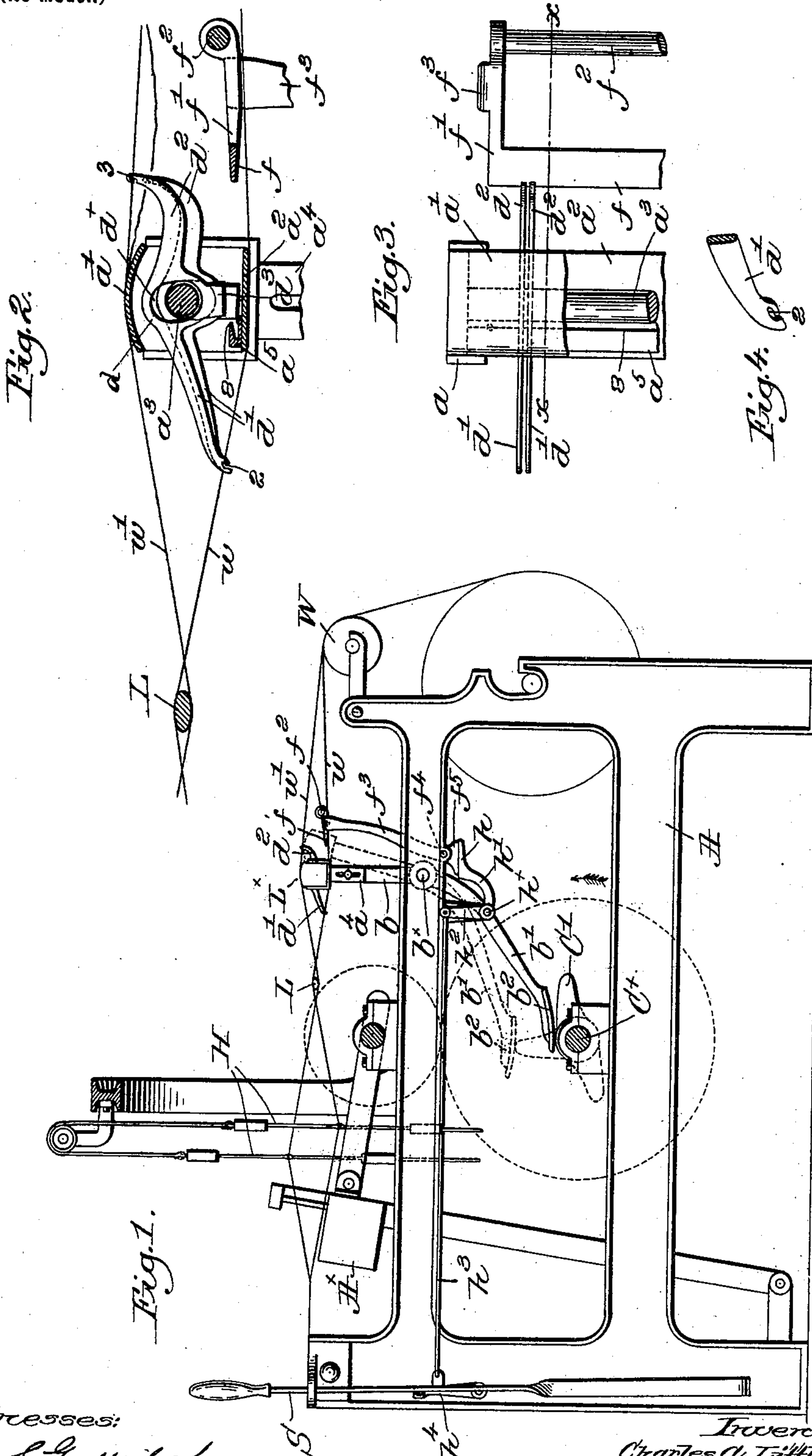
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C. A. LITTLEFIELD.

WARP STOP MOTION FOR LOOMS.

(Application filed Aug. 22, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 620,465, dated February 28, 1899.

Application filed August 22, 1898. Serial No. 689,227. (No model.)

To all whom it may concern:

Be it known that I, CHARLES A. LITTLEFIELD, of Lowell, county of Middlesex, State of Massachusetts, have invented an Improvement in Warp Stop-Motions for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters and figures on the drawings representing like parts.

This invention has for its object the production of novel warp-stop-motion mechanism for looms, the peculiar location and operation of the controlling devices for said mechanism being very effective and convenient, the stoppage of the loom being automatically effected by or through the abnormal positioning of a detector due to failure of a warp-thread or the tangling or crossing of two or more threads.

Various novel features of my invention will be hereinafter described in the specification and particularly pointed out in the claims.

Figure 1 is a right-hand side elevation of a sufficient portion of a loom to be understood with one embodiment of my invention applied thereto. Fig. 2 is an enlarged sectional detail on the line $x x$ of the stop-motion controlling or actuating detectors and the cooperating feeler. Fig. 3 is a top or plan view thereof, and Fig. 4 is a partial detail of one of the detectors in perspective.

The loom-frame A, lay A^x , harnesses H, cam-shaft C^x , and shipper-lever S may be and are all of usual or well-known construction. I employ the usual front lease-rod L; but instead of the usual back lease-rod I make use of a skeleton or box-like member L^x , extended across the warps and dividing them into upper and lower portions, said member having the function of a lease-rod and also serving as a detector-support, said member being herein shown as comprising two end pieces a , rigidly connected by a preferably convex top piece a' and a bottom piece a^2 , thus leaving the front and rear of the support open, with a bar a^3 extended from one to the other end piece and firmly mounted therein. This member L^x is in effect a lease-rod, as stated, as the warps $w w'$ pass beneath and over it, respectively, on their way from the whip-roll W to the rod L, and the said combined lease-rod

and detector-support is mounted by means of depending legs a^4 on the end pieces on rocker-arms b , rigidly attached to a rock-shaft b^x , having its bearings in the loom sides, bolts 5 passing through slots in the legs a^4 and into the rocker-arms to maintain the member L^x in desired vertical position. To the rock-shaft b^x is secured an arm b' , provided at its lower end with a suitable shoe b^2 to travel over a tappet-cam C' on the cam-shaft C^x , so that the rotation of the latter will vibrate the lease-rod or detector-support L^x in the direction of the length of the warps, more efficiently separating the upper and lower sections of the warp. On the rod a^3 are mounted the detectors, preferably made of thin sheet metal and consisting of a central body portion d , Fig. 2, with oppositely-extended arms d' d^2 and an elongated upright slot d^x in the body portion, through which the bar a^3 is extended, the body terminating in a depending foot d^3 . The arms extend through the open back and front of the support L^x , and, as herein shown, the front arms d' are turned downward and provided at their extremities with open slots or notches 2 to receive each one of the warp-threads w , while the rearwardly-extended arms d^2 are upturned and suitably notched, as at 3, to receive the upper threads w' . Thus each detector is controlled as to its position by two warp-threads, which are separated by the detector-support or lease-rod L^x , and when the threads are unbroken and under proper tension the detectors are tipped or lifted up, so that the feet d^3 thereof are held well above the bottom a^2 of the support. When either thread of a pair breaks, however, or becomes unduly slack, the detector will descend relatively to the bar a^3 , so that the latter will be at the upper end of the slot d^x , the farther detector in Fig. 2 being shown in such abnormal position, and its foot will depend in front of a stop-bar, shown as a strip of metal a^5 , fixed to the bottom a^2 of the support and bent over upon itself, its free edge 8 extending across in front of the series of detector-feet d^3 .

It will be remembered that the support L^x is vibrated, serving to clear dust or lint from the warps under normal conditions; but when

a detector is in abnormal position its foot d^3 is then brought into engagement with a normally stationary feeler f . This feeler f is shown as a flat plate having rearward extensions f' at its ends connected by a rod or bar f^2 , the feeler and bar being above and extended across the lower set w of warp-threads, rocking arms f^3 , fulcrumed on the loom-frame at f^4 , being secured to the feeler at their upper ends. One of the rocking arms has below its fulcrum a lateral enlargement or foot f^5 , which rests on the flattened end h of one arm h' of a bell-crank lever fulcrumed at h^x on a suitable bracket, the other arm h^2 being pivotally connected by a link h^3 (see Fig. 1) with a knock-off arm h^4 to release the shipper-handle S from its usual holding-plate.

Referring to Fig. 1, it will be evident that in whatever direction the feeler f is moved from normal position its foot f^5 will rock the bell-crank lever $h' h^2$ to actuate the knock-off arm h^4 and so stop the loom. Now if a detector is in abnormal position as the support L^x swings toward the feeler f the foot d^3 of the detector is held in position by the stops a^5 , and coming into engagement with the feeler will move it toward the back of the loom, the feeler swinging on the arms f^3 and effecting, as described, the stopping means for the loom. Should a bunch on the warp engage the bar f^2 or the feeler or should some of the upper and lower threads stick together, the bar and feeler will either clear or separate them or said connected parts will be moved forward by the obstruction until the foot f^5 operates as before to rock the bell-crank lever and effect the stopping of the loom. Thus I have provided means for stopping the loom upon either breakage or undue slackness of the warp-threads or upon the occurrence of an obstruction therein, and by enlarging and altering the construction of the back lease-rod I utilize it further as a detector-support.

I prefer to mount the detectors on the modified back lease-rod, because the warps at that point are not affected by the formation of the shed as they are at the front lease-rod.

My invention may be modified or varied, as regards the construction and arrangement herein shown, without departing from the spirit and scope of my invention, one practical embodiment thereof being herein illustrated and described.

Having fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a loom, a lease-rod, a series of stop-motion-actuating detectors mounted thereon and controlled as to their position by the warp-threads, and stopping means for the loom, actuated by or through abnormal positioning of a detector due to failure of a warp-thread, to effect the operation of the stopping means.

2. In a loom, a lease-rod, a series of stop-motion-actuating detectors mounted thereon

and having each two oppositely-extended arms provided with openings to receive a thread from the warps above and below the lease-rod, stopping means for the loom, and means, actuated by or through abnormal positioning of a detector, to effect the operation of the stopping means, the two warp-threads for each detector normally maintaining it in inoperative position.

3. In a loom, a lease-rod, means to vibrate it in the direction of the length of the warp-threads, a series of stop-motion-actuating detectors mounted upon the lease-rod and controlled as to their position by the warp-threads, and stopping means for the loom, actuated by or through abnormal positioning of a detector due to failure of a warp-thread, to effect the operation of the stopping means.

4. In a loom, a skeleton lease-rod open at its front and back and having a bar therein extended from end to end, a series of slotted detectors mounted loosely on said bar and having oppositely-extended and turned arms, each with an opening to receive a warp-thread, a depending foot on each detector, and a stop for said feet when abnormally positioned, combined with a feeler to engage the foot of a dropped detector, means to effect relative movement of the lease-rod and feeler, and stopping means for the loom, operated by or through engagement of the feeler with the foot of a detector one or both of whose controlling warp-threads has failed.

5. In a loom, a series of stop-motion-actuating detectors controlled as to their position by the warp-threads, a coöperating feeler extended across and between the upper and lower sets of the warp-threads, and stopping means, actuated to effect stoppage of the loom by or through the operative engagement of the feeler and a detector in abnormal position due to failure of its warp-thread, and also by an obstruction of the warp-threads engaging and effecting movement of the feeler.

6. In a loom, a detector-support extended across the warp-threads between the two groups thereof which are to form the planes of the shed, a series of stop-motion-controlling detectors each having coöperative engagement with an intact and properly-taut warp-thread in each of said groups, stopping means for the loom, and means actuated by or through abnormal positioning of a detector to operate said stopping means.

7. In a loom, a skeleton lease-rod having a bar extended from end to end, rocking supports for the lease-rod, means to vibrate it, a series of detectors having slots to receive the said bar and normally controlled as to their position by the warp-threads, a normally stationary, pivotally-mounted feeler extended between the two groups of warps and adapted to be engaged and rocked in one direction by an abnormally-positioned detector, an obstruction in the warps engaging and rocking said feeler in the opposite direction, stopping

means for the loom, and operating connections between said means and the feeler, actuated by rocking of the latter.

5 8. In a loom, a lease-rod, a series of stop-motion-actuating detectors pivotally mounted thereon and each coöperatively engaging a warp-thread above and below the lease-rod, failure or undue slackness of either thread of a pair effecting abnormal positioning of their
10 detector, and stopping means for the loom, operated by or through abnormal positioning of a detector.

15 9. In a loom, a detector-support extended between the two groups of warp-threads which are to form the planes of the shed, a series of rocking and bodily-movable detectors mounted on said support and each coöperating with a warp-thread of each group, to be normally held thereby in inoperative position, and stop-
20 ping means for the loom, operated by or through abnormal positioning of a detector.

10. In a loom, a detector-support extended between the two groups of warp-threads which are to form the planes of the shed, a series of rocking and bodily-movable detectors mount- 25 ed on said support and each coöperating with a warp-thread of each group, to be normally held thereby in inoperative position, a feeler adapted to coöperate with an abnormally-positioned detector, means to effect relative 30 movement of the detector-support and feeler, and stopping means for the loom operated by or through engagement of the feeler with an abnormally-positioned detector.

In testimony whereof I have signed my 35 name to this specification in the presence of two subscribing witnesses.

CHARLES A. LITTLEFIELD.

Witnesses:

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