No. 649,419. Patented May 8, 1900.

W. E. ALLEN.

WARP STOP MOTION FOR LOOMS.

(Application filed Jan. 10, 1900.)

(No Model.)

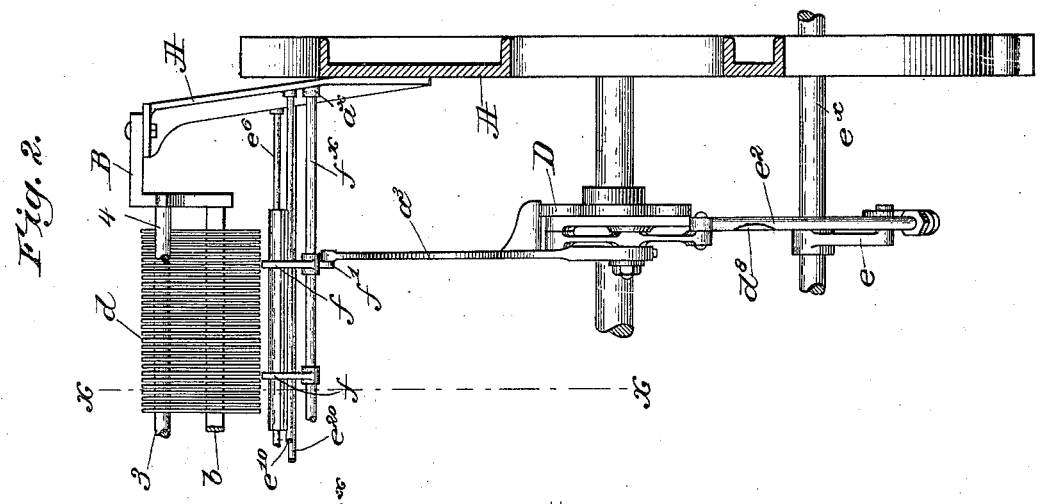

Fig. 2.

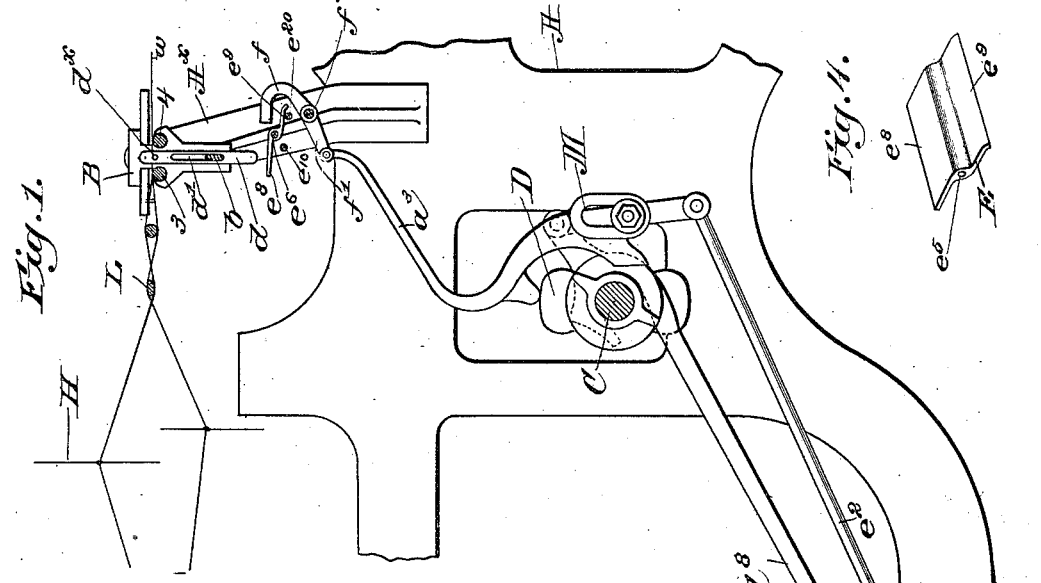

Fig. 1.

Fig. A.

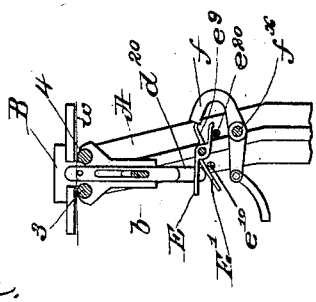

Fig. 3.

Witnesses:
Frank L. Hattie.
Edward H. Allen.

Inventor:
William E. Allen,
by Lemuel W. Serrell & Gregory
Attys.

UNITED STATES PATENT OFFICE.

WILLIAM E. ALLEN, OF SALEM, MASSACHUSETTS, ASSIGNOR TO THE DRAPER COMPANY, OF PORTLAND, MAINE, AND HOPEDALE, MASSACHUSETTS.

WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 649,419, dated May 8, 1900.

Application filed January 10, 1900. Serial No. 964. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. ALLEN, of Salem, county of Essex, and State of Massachusetts, have invented an Improvement in Warp-Stop-Motion Mechanism 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 relates to that type of warp-stop-motion mechanism wherein the failure or undue slackness of a warp-thread is made effective through suitable mechanism to stop the operation of the apparatus in which the stop mechanism is included—such, for instance, as a loom—the normal warp-threads—that is to say, such as are in proper condition—normally maintaining a series of movable detectors in inoperative position, release of a detector acting to set in motion suitable stopping means. In one form of mechanism of the before-described type the vibrator engages and is arrested by a released detector, and in such construction the detector thus engaged is subjected to more or less strain. In my present invention I have devised novel means for arresting the vibrator upon the movement of a released detector into operative position, but without in any manner subjecting the detector to any strain whatsoever due to or incident upon stoppage of the apparatus.

Figure 1 is a cross-sectional view on the line $x\,x$, Fig. 2, of a portion of a loom with one embodiment of my present invention applied thereto. Fig. 2 is a rear elevation of a portion of the loom to show the warp-stop-motion mechanism. Fig. 3 is a sectional detail showing the operation of the device upon release of a detector, and Fig. 4 is a perspective detail to be referred to.

While I have herein shown my invention as applied to a loom as being probably the most extended for its use, the invention is not restricted to such application, nor is it restricted to the precise construction and arrangement herein shown and described, one practical embodiment thereof being illustrated without attempting to show and describe various embodiments or changes which may be made therein without departing from the spirit and scope of my invention.

The loom-frame A, the shipper-lever S, the harnesses H, lease-rods L, the knock-off arm e' on the rock-shaft $e^{\times}$, and the cam-shaft C may be and are all of usual or well-known construction.

In accordance with the present embodiment of my invention stands $A^{\times}$, only one of which is shown in the drawings, are secured to the loom sides and support L-shaped brackets B, connected by a cross-bar b, and above the cross-bar by two rods 3 4, which form warp-rests, as shown clearly in Fig. 1, and the bar b, which is flattened and set on edge, is extended through longitudinal slots d' of a series of detectors d, preferably made of thin flat sheet metal, and provided each with a warp-eye $d^{\times}$, the upper ends of the detectors being shown as extended upwardly between the warp-rests and held in the position shown in Fig. 1 by the warp-threads w, passed through the warp-eyes. The slots d' are of greater length than the depth of the bar b, so that a detector when released will descend from the position shown in Figs. 1 and 2 and to be hereinafter described.

Below the detectors I have shown a series of tilting detents E, (shown separately in Fig. 4,) preferably made of light sheet metal and provided with a longitudinal hole e^5, through which is extended a fulcrum-rod e^6, fixedly supported at its ends in the standards $A^{\times}$. The detents are oppositely bent or offset, as herein shown, at opposite sides of the longitudinal center, as at e^8 e^9, the part e^9 being slightly heavier than the part e^8, so that normally the detents will be in the position shown in Fig. 1, the parts e^9 resting on a stop, shown as a rod e^{20}, extended between the standards $A^{\times}$. The lighter portions e^8 of the detents extend beneath the series of detectors, the weight of one of the latter when resting upon the detent below it being sufficient to tilt the latter into the position in Fig. 3 for the detent E'. When the released detector, as d^{20}, Fig. 3, moves into operative position as a result of the failure of its warp-thread $w^{\times}$ or by undue slackness of the latter and operates to tilt the detent, the part e^9 of the detent is moved into the path of a normally-moving vibrator, to be described, the engagement of the vibrator with a detent device operating

through suitable means to release the shipper S and stop the apparatus. A second stop-rod e^{10}, extended beneath the portions e^8 of the several detents, serves to limit the tilting movement due to engagement with a released detector, as shown in Fig. 3.

The vibrator may be constructed in any suitable or convenient manner, and I have herein shown the same as comprising a rock-shaft $f^\times$, mounted in bearings $a^\times$ on the standards $A^\times$ and having a series of upturned bent arms or fingers f, preferably one for each detent, the normal swing of the arms or fingers f clearing the portions e^9 of the detents, as shown in Fig. 1. An arm f', fast on the rock-shaft, is pivotally connected to a bent arm a^8, raised by cam mechanism, so that the vibrator will be moved away from the detents positively, but by gravity toward the latter.

The mechanism between the vibrator and the shipper S may be substantially such as shown in United States Patent No. 622,182, dated March 29, 1899, the feeler-cam D being mounted on the cam-shaft C.

The rock-shaft $e^\times$ has its arm e connected by a rod e^3 and link d^3 with the cam-actuated mechanism, the latter being indicated, generically, herein by the letter M.

When the movement of the vibrator is arrested by engagement with one of the detents, the rock-shaft $e^\times$ is turned to release the shipper by or through the knock-off arm e', as in the patent hereinbefore referred to.

The tilting detent device manifestly takes up all of the strain or shock incident to arrest of the vibrator and the parts connected therewith, the detector being absolutely free from any such pressure or strain, and the number of sections into which the detent device is divided will be determined principally by the weight of a section which can be tilted into operative position by impact of a released detector.

The series of detectors will practically be divided into groups corresponding each with one of the detent devices or sections, any detector of a group coöperating with the corresponding detent-section.

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

1. In warp-stop-motion mechanism, groups of detectors maintained inoperative by normal warp-threads, a normally-moving vibrator, a plurality of devices normally out of the path of the vibrator and each movable by a released detector of a corresponding group, to present one of its edges to engage and stop the vibrator, and stopping means actuated by or through such stoppage of the vibrator.

2. In warp-stop-motion mechanism, groups of detectors maintained inoperative by normal warp-threads, a normally-moving vibrator, a plurality of independent, pivotally-mounted plates each tilted by a released detector of a corresponding group to bring one edge of the plate into the path of and engage the vibrator, to stop the latter, and stopping means actuated by or through arrest of the vibrator when engaged by one of said plates.

3. In warp-stop-motion mechanism, a series of independently-movable detectors maintained inoperative by normal warp-threads, a normally-moving vibrator, a plurality of tilting detents, any one of which will be moved to bring one of its edges into operative position in the path of the vibrator by engagement with a released detector, to thereby engage and arrest the vibrator, stops to limit the tilting movement of said detents, and stopping means actuated by such arrest of the vibrator.

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

WILLIAM E. ALLEN.

Witnesses:
JOHN C. EDWARDS,
AUGUSTA E. DEAN.