

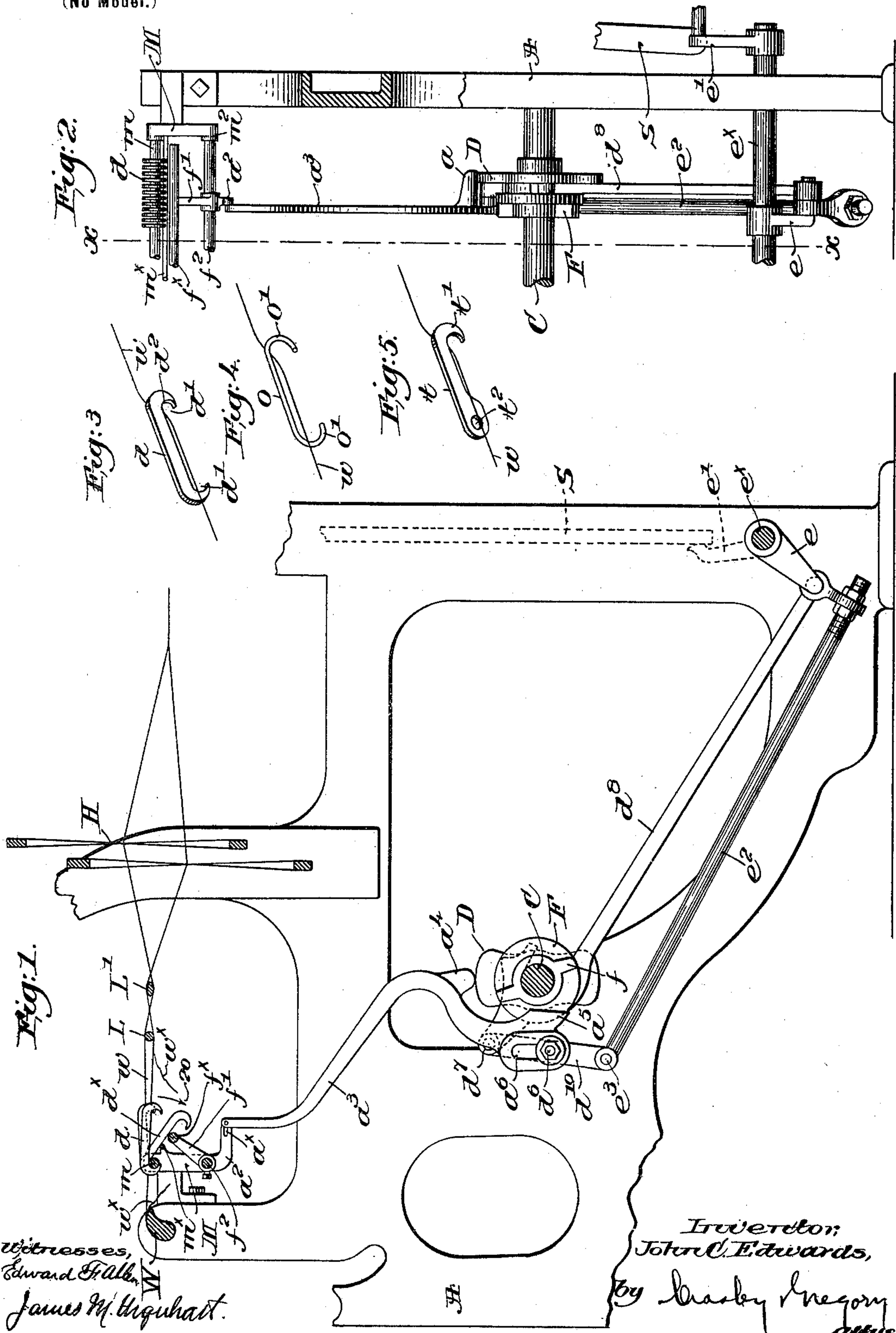
No. 630,200.

Patented Aug. 1, 1899.

J. C. EDWARDS.
WARP STOP MOTION MECHANISM.

(Application filed Mar. 13, 1899.)

(No Model.)



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UNITED STATES PATENT OFFICE.

JOHN C. EDWARDS, OF BROOKLINE, MASSACHUSETTS, ASSIGNOR TO THE
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WARP-STOP-MOTION MECHANISM.

SPECIFICATION forming part of Letters Patent No. 630,200, dated August 1, 1899.

Application filed March 13, 1899. Serial No. 708,819. (No model.)

To all whom it may concern:

Be it known that I, JOHN C. EDWARDS, of Brookline, county of Norfolk, and State of Massachusetts, have invented an Improve-
5 ment in Warp-Stop-Motion Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

10 This invention relates to warp-stop-motion apparatus particularly adapted for use with looms wherein the engagement of a normally moving feeler by an abnormally-positioned detector operates to automatically effect the
15 stoppage of the apparatus to which the stop-motion is applied. I have herein shown the detectors so mounted upon a fixed support as to have an angular or rotative movement from operative into inoperative position, the de-
20 tectors being provided at their free ends each with an open hook adapted to straddle the normal warp-threads, said hook moving into position to engage the feeler upon failure or undue slackness of the warp-thread coöper-
25 ating therewith. The engagement of the feeler with such a released detector subjects the latter to tensile strain in a direction substantially radial to the fixed detector-support.

I prefer to make the detectors symmetrical
30 at each end to thereby enable me to use them reversibly, and also to permit of their application at any time to their fixed support and the warp-threads, the latter preferably passing over and being sustained by the fixed
35 detector-support.

I have for convenience herein illustrated my invention as applied to a loom.

Figure 1 is a longitudinal sectional view of a portion of a loom with one embodiment of my
40 invention applied thereto, taken on the line $x x$, Fig. 2. Fig. 2 is a partial front elevation of the apparatus shown in Fig. 1. Fig. 3 is an enlarged perspective view of my preferred form of detector shown as made of thin flat
45 sheet metal. Fig. 4 is a view of a similar detector made of stout wire, and Fig. 5 is a modified form of detector to be referred to.

The greater part of the loom mechanism proper has been omitted in the drawings, the
50 harnesses H, the whip-bar W, and lease-rods

L L' being of any usual or suitable construction, and I have herein shown the stop-motion controlling or actuating detectors as located back of the lease-rods.

The detectors may be made of thin hard- 55
ened sheet metal, as shown Figs. 1, 3, and 5, cut or otherwise shaped, a series of such detectors d being loosely mounted to move angularly or rock on a fixed rod or shaft m extended across the loom and held in suitable 60
brackets N, attached to the loom-frame A.

The detectors are so made as to present, either at one or at both ends, and preferably the latter, a curved inturned open hook d' at the under side of the straight elongated body 65
portion of the detector to form a feeler-engaging portion.

It will be noticed that the preferred form of detector shown in Figs. 1 and 3 is shaped sym-
metrically at each end, and the bottom of 70
each hook is made, preferably, as a circular arc d^2 , substantially tangent to the under side or edge of the detector-body.

Referring now to Fig. 1, the detectors d are shown as mounted on the support m , which 75
engages or enters the hooks at one end, while the hooks at the other or free ends of the detectors straddle the normal warp-threads w , and are thereby held in inoperative position. The warp-threads pass from the whip-bar 80
preferably over the detector-support m , and are thereby sustained adjacent the detectors. The pull of the threads is sufficient to maintain the rear hooked ends of the detectors in position snugly against the support, and to 85
prevent undue angular movement of a detector when released by failure or slackness of its warp-thread I extend a rod or bar m^x beneath the series of detectors to form a stop therefor. When in normal position, the 90
free hooked ends of the detectors are held above and out of the path of movement of the coöperating feeler. The latter is shown in Figs. 1 to 3 as a cylindrical bar f^x to present a convex engaging surface and of such a size 95
as to enter the open hook of a released detector, the feeler being attached by arms f' to a rock-shaft f^2 , having bearings at m^2 in the brackets M.

Failure or undue slackness of a warp-thread 100

permits its detector to turn or move angularly on the support m in a downward direction into the position shown at d^x , Fig. 1, to bring its hooked end into the path of and to engage the feeler as the latter rocks in the direction of the arrow 20, Fig. 1, the normal throw or stroke of the feeler in such direction being greater than when it is engaged by a detector. The feeler enters the hook of the released detector and brings up against the bottom d^2 thereof, and the movement of the feeler on what may be termed the "feeling-stroke" is thus arrested. The resistance of the detector to any further movement of the feeler being substantially radial to the detector-support and subjecting the detector to a tensile strain, there is no tendency to bend, buckle, or twist the detector, obviating the necessity for any lateral guides or detector-supports.

Should a detector be released when the feeler is at or near the end of its feeling-stroke, the feeler will travel under the curved end of such detector and will lift it on its back stroke until it passes beyond the hook, the stop m^x preventing the detector from moving beyond the point where it may be engaged by and so ride over the feeler.

It will be noted that the detectors can be applied to the warp-threads and detector-support by merely placing them in position with one hook straddling the warp-thread and the other hook embracing the detector-support, so that detectors can be applied at any time or removed without any rearrangement of the apparatus.

Instead of making the detectors of sheet metal, as shown in Figs. 1 to 3, they may be made of stout wire, as shown in Fig. 4, the straight body o being bent at its ends to form the open inturned hooks o' , the operation of such detector being precisely that hereinbefore described.

In Fig. 1 the warp-thread w^x , which cooperated with the released detector d^x , is shown as broken.

In Fig. 5 a modified form of detector is shown, made of sheet metal, it may be, the body t having at one end a hook t' to form a warp-receiving and feeler-engaging portion, while the other end of the detector is provided with an eye or hole t^2 to be strung upon the detector-support. With this modified form of detector it will be manifest that the reversible feature is omitted and the detectors cannot be positioned unless the support m is detached from its bearing at one end.

The reversible construction is preferred not only on account of the ready positioning or removal of the detector attained thereby, but also on account of the fact that the life of the detector is thereby increased, for notwithstanding the fact that these detectors are preferably made of hardened steel the constant wear of the warp-threads will tend to nick or cut out the metal, and after one end of the detector has become too much rough-

ened or cut to be further serviceable the detector can be reversed and the nicked hook brought into engagement with the support.

Any suitable means may be employed to effect the normal vibration of the feeler and to operate the stopping means for the apparatus, the form herein shown being substantially that illustrated in United States Patent No. 618,378, dated January 24, 1899, similar letters of reference being herein applied to like parts.

A forwardly-bent arm a^2 , attached to the rock-shaft f^2 , is pivotally connected, preferably by a slot-and-pin connection, as at a^x , Fig. 1, with a bent arm a^3 , having a bunter a^5 and a toe a^4 , normally resting by its weight on an edge cam D , mounted on the cam-shaft C , the bunter being moved by the rotation of the cam into or out of the path of one or more tappets f of a cam F , also fast on the shaft C . Upon arrest of the feeler the bunter a^5 is held up in the path of a tappet, engagement therewith swinging the link or arm a^3 to the rear. This arm is slotted at a^6 to receive a stud d^6 on a short lever d^{10} , pivoted at its upper end at d^7 to a link d^8 , hooked around the cam-shaft and joined at its other end to an arm e of a rock-shaft e^x , provided with a knock-off arm e' for the shipper-lever S . The rod e^2 is jointed at its ends to the arm e and the lower end of the lever d^{10} , the joint e^3 acting as a fulcrum for the lever d^{10} when the bunter is acted upon by a tappet, the swinging of the upper end of the lever moving the link d^8 longitudinally to operate the knock-off arm.

The feeling-stroke of the feeler is due to gravity, while its reverse stroke is positively effected by the mechanism shown.

My invention is not restricted to the particular feeler-actuating mechanism herein shown, nor to the precise location and arrangement of parts, as the same may be modified or rearranged without departing from the spirit and scope of my invention.

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

1. As a new article of manufacture, a warp-stop-motion detector having a straight, elongated body provided at one end with a single open hook to receive a warp-thread and also to form a feeler-engaging portion.

2. As a new article of manufacture, a warp-stop-motion detector having an elongated body symmetrically curved at each end to form like inturned, open hooks, substantially as and for the purpose set forth, either of said hooks being adapted to receive a warp-thread and also to form a feeler-engaging portion.

3. As a new article of manufacture, a warp-stop-motion detector having an elongated body symmetrically curved at each end to form inturned, open hooks the bottoms of which are circular arcs tangential to the under side of the body, substantially as and for the purpose set forth.

4. In an apparatus of the class described,

a series of detectors maintained inoperative by normal warp-threads and each having an open, hook-like end to form a common feeler-engaging and warp-receiving portion, a support on which said detectors are mounted to move angularly when released by failure or slackness of their warp-threads, a cooperating feeler to engage and subject a released detector to tensile strain, and stopping means operated by or through the feeler upon its engagement with a detector.

5. In an apparatus of the class described, a series of detectors maintained inoperative by normal warp-threads and each having a downwardly-curved end to form an inturned open hook adapted to straddle a warp-thread, a fixed support on which said detectors are mounted to move angularly when released by failure or undue slackness of their warp-threads, said support arranged to sustain the warp-threads, a cooperating feeler having a convex surface corresponding to the curvature of and to engage the hooked end of a re-

leased detector and subject the latter to tensile strain, and stopping means operated by or through the feeler when so engaged.

6. In an apparatus of the class described, a fixed support, a series of detectors maintained inoperative by normal warp-threads and each having an elongated body symmetrically curved at both ends to form inturned, open hooks, one hook engaging the fixed support and the other end straddling a warp-thread, a cooperating feeler to enter the hook of and engage the free end of a detector released by failure or slackness of its warp-thread, and stopping means operated by or through the feeler when so engaged.

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

JOHN C. EDWARDS.

Witnesses:

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