

No. 645,912.

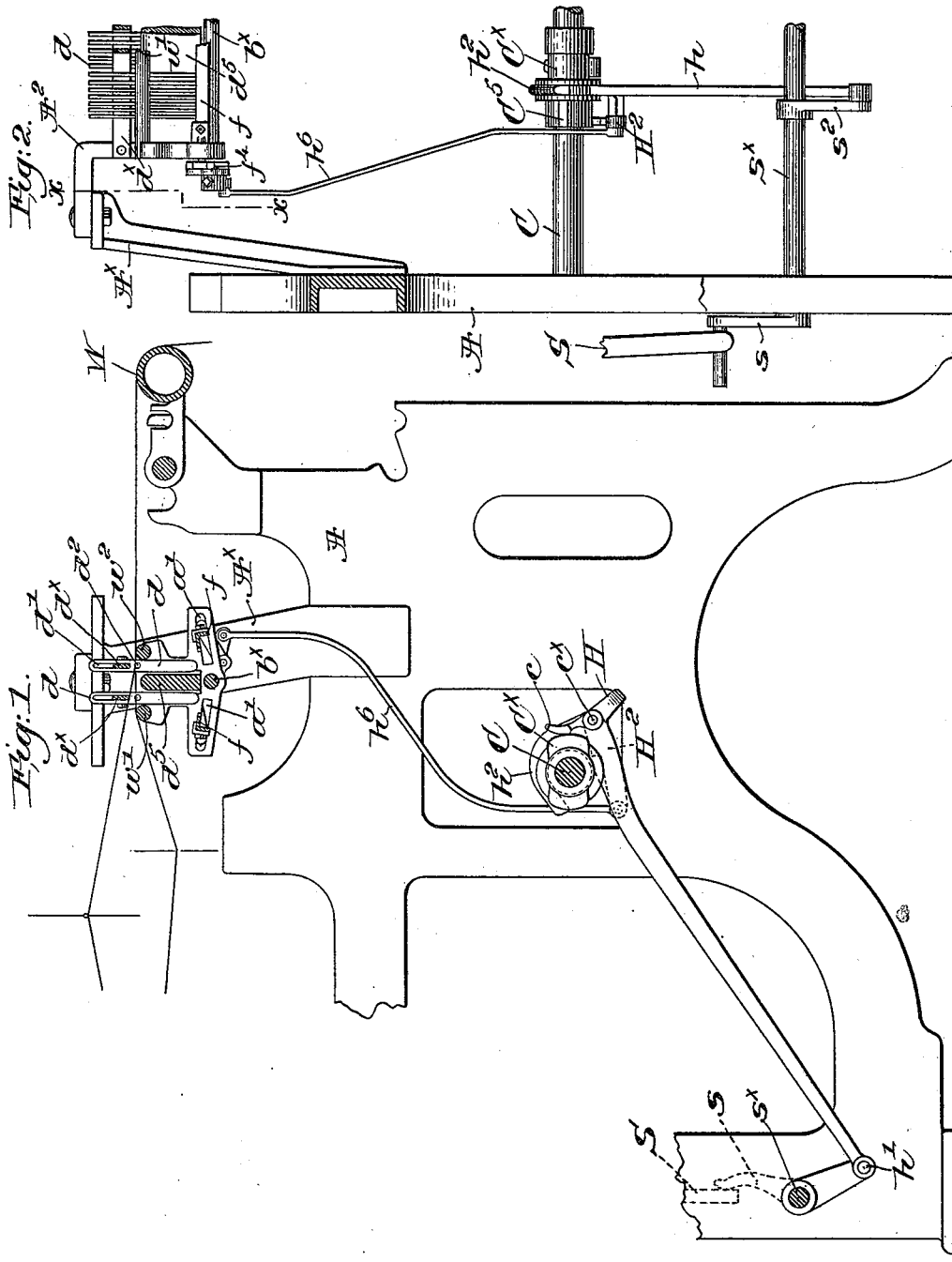
Patented Mar. 20, 1900.

A. W. CLEMENT.
WARP STOP MOTION FOR LOOMS.

(Application filed Dec. 22, 1899.)

(No Model.)

2 Sheets—Sheet 1.



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2 Sheets—Sheet 2.

Fig. 3.

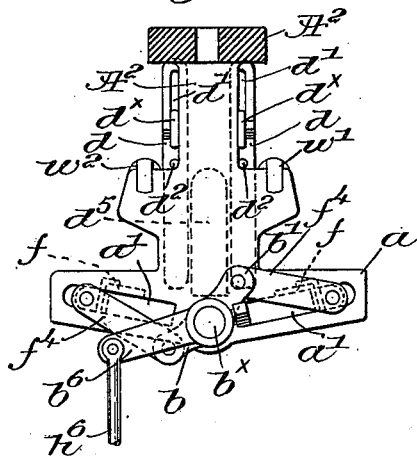


Fig. 4.

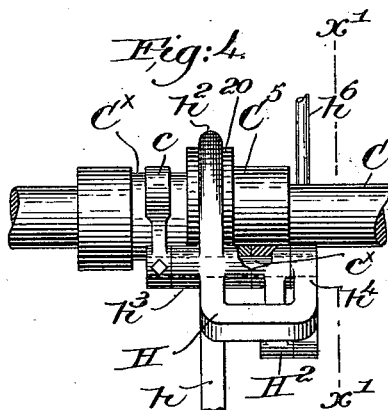


Fig. 5.

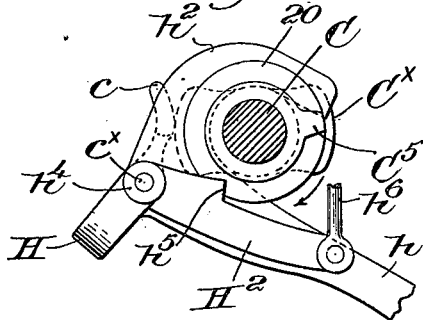
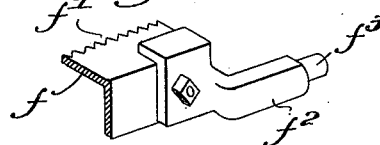


Fig. 6.



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UNITED STATES PATENT OFFICE.

ALVAH W. CLEMENT, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR TO THE
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WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 645,912, dated March 20, 1900.

Application filed December 22, 1899. Serial No. 741,250. (No model.)

To all whom it may concern:

Be it known that I, ALVAH W. CLEMENT, a citizen of the United States, residing at Hopedale, county of Worcester, 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 relates to warp-stop-motion mechanism of the type wherein normally-inoperative detecting devices are made operative upon breakage or undue slackness of the warp-threads to effect the actuation of suitable stopping means; and the invention has for its object the production of novel and improved mechanism of the specified type, the various novel features being fully described in the specification hereinafter and particularly pointed out in the claims.

Herein one practical embodiment of the invention is illustrated in connection with a loom, as the most extended use of the invention will probably be in connection with such apparatus; but the invention is not restricted to such an application.

Figure 1 is a sectional view of a portion of a loom, taken from front to back, with one form of the novel stop-motion mechanism embodied therein. Fig. 2 is a partial front elevation thereof. Fig. 3 is an enlarged vertical sectional detail view on the line $x x$, Fig. 2, looking toward the right. Fig. 4 is an enlarged rear elevation, partially broken out, of a portion of the stopping means to be described. Fig. 5 is a sectional view thereof on the line $x' x'$, Fig. 4, looking to the left; and Fig. 6 is an enlarged perspective detail of one of the feeler-journals to be described.

One of the side frames A of a loom, the cam-shaft C, and the shipper-lever S, only a portion of the latter being shown as constituting one part of the stopping means, may be of any well-known or usual construction, the shipper-lever being act upon by a knock-off arm s , fast on a rock-shaft s^x , mounted on the loom-frame and actuated at the proper time by means to be described to release the shipper-lever from its usual holding-notch.

The warp-stop-motion mechanism is herein shown as comprising two series of controlling-detectors d , located between the shedding mechanism and the whip-roll W, said detectors being longitudinally slotted, as at d' , and provided each with a warp-receiving eye d^2 . Stands A^x on the loom-frame have bolted thereto depending L-shaped brackets A^2 , to which are secured transverse supporting-bars d^x , set on edge and extended through the longitudinal slots of the detectors to sustain them when freed from control of their warp-threads, the lower ends of the two series of detectors being herein shown as separated by a plate d^5 , forming a back stop or rest. Two warp-rests, shown as bars $w' w^2$, Fig. 1, extend from one to the other of the brackets A^2 , it being understood that while only one of such brackets is herein shown each loom side will support such a bracket, the warp-rests $w' w^2$ being located in front of and at the rear of the series of detectors, respectively, to sustain the warps as they pass to the shedding mechanism. Each bracket A^2 is provided with a transversely-extended foot a , and in the present embodiment of the invention said foot is shown as extended an equal distance in opposite directions toward the front and back of the loom and provided with slotted guideways a' , said guideways converging and being downwardly inclined toward the lower ends of the detectors, as clearly shown in Figs. 1 and 3.

Each series of detectors is herein shown as provided with its respective cooperating feeler f , which may be conveniently formed of an angle-iron, the web of which has its edge toward the detectors toothed or serrated, as at f' , said feeler having attached to each of its ends a journal member f^2 (shown best in Fig. 6) and made polygonal in cross-section to easily fit the guideway or guide a' and to slide therein back and forth. The extremity of each journal is reduced and rounded, as at f^3 , to receive a link f^4 , the two links f^4 at one side of the loom being pivotally connected at their inner ends with two substantially oppositely extended arms b and b' , fast on a rock-shaft b^x , mounted in suitable bearings on the lower end of the bracket A^2 , it being noted that the

feeler-guides a' are located symmetrically with relation to said rock-shaft. Obviously the oscillation of the rock-shaft will, through the arms b b' and the connecting-links f^4 , serve to vibrate the feelers f toward and away from each other and the lower ends of the series of detectors d . It is preferable to thus connect the feelers with the rock-shaft at each end to preserve proper alinement of the feelers during their vibration. The path of a feeler in accordance with this invention is thus in a plane instead of in the arc of a circle and the plane path of movement is downwardly inclined toward the lower end of the detector, so that the liability of the detector slipping up while under pressure due to engagement with the feeler is obviated.

The detectors herein shown are usually made of thin flat sheet metal with rounded lower ends, and it sometimes happens in warp-stop devices wherein the feeler moves in a circular arc that the said feeler striking on the rounded end of the detector will push the latter up out of the way, so that the feeler will not operate promptly to stop the loom.

It will be manifest from the foregoing description and the drawings that one feeler and a single series of detectors could be employed, if desired, the sliding movement of the feeler upon its straight supporting-guides being precisely the same and the direction of its action upon a dropped detector being the same.

The warp-threads, as usual, pass through the eyes in the detectors, and while the threads are in normal condition—that is to say, intact and properly taut—the detectors will be maintained out of the path of movement of the feeler; but upon failure of a warp-thread or undue slackness thereof the detector controlled by such thread will move into operative position to engage the feeler. Such engagement of the feeler is made operative to effect the stoppage of the loom by any suitable mechanism.

Herein is shown one convenient form of feeler-actuating mechanism. The cam-shaft C of the loom has fast upon it a feeler-actuating-cam C^x , shown in Fig. 5 as having a double throw, so that the cam will operate twice for every revolution of the cam-shaft, said cam being normally engaged by toe c , fast on a rock-shaft c^x , mounted in a bunter-carrier H . (See Figs. 4 and 5.) This bunter-carrier H is shown as a yoke having a rigidly-attached arm h , pivotally connected at its lower end at h' to an arm s^2 on the rock-shaft s^x and at its upper end hooked or curved, as at h^2 , to embrace an annularly-grooved collar 20 on a cam-shaft C . The yoke-like bunter-carrier H provides elongated bearings h^3 h^4 for the short rock-shaft c^x , said rock-shaft also having fast thereon the bunter, (shown as an arm H^2 ,) having a shoulder h^5 , which at times is adapted to be engaged by a tappet-cam C^5 , fast on the cam-shaft C . The free end of the bunter H^2 is connected by link

h^6 with an arm b^6 , fast on the rock-shaft b^x , the weight of the parts being sufficient to draw the feelers toward the detectors on one stroke, while the cam C^x will effect the opposite movement, the link being connected eccentrically with the rock-shaft by the said arm b^6 . If now the inward movement of a feeler is arrested, as by engagement with a dropped detector—that is, one in operative position—the bunter H^2 will be held up in the position shown in Fig. 5, with the shoulder h^5 in the path of movement of the tappet-cam C^5 , and thereby the bunter-carrier H and the link h will be moved to the left, viewing Fig. 5, or toward the rear of the loom, as shown in Fig. 1, and the shaft s will be rocked to release the shipper-lever by the action of the knock-off arm s , and the loom will be stopped. The hooked end h^2 of the link h permits such longitudinal movement of the latter while guided by the grooved collar 20.

The invention is not restricted to the precise construction and arrangement of parts herein shown and described, as the same may be modified or rearranged without departing from the spirit and scope of the invention.

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

1. In warp-stop-motion mechanism, a series of movable detectors maintained inoperative by normal warp-threads, a cooperating feeler, fixed straight guides therefor downwardly inclined toward the lower ends of the detectors, means to normally slide the feeler back and forth upon the guides, including a rock-shaft having an arm fast upon it, and a link connecting said arm and feeler, and stopping means operative by or through the feeler upon its engagement with a detector in operative position.

2. In warp-stop-motion mechanism, two series of movable detectors maintained inoperative by normal warp-threads, a cooperating feeler for each series, fixedly-mounted plane supporting-guides for the ends of the feelers, downwardly convergent and arranged at right angles to the length of the feelers, means to reciprocate the feelers on their guides, including a rock-shaft having oppositely-extended arms, and links connecting the arms with the feelers, and stopping means operated by or through arrest of a feeler when engaged by a detector in operative position.

3. In a loom, a shipper-lever, a knock-off arm therefor, a series of stop-motion detectors maintained inoperative by normal warp-threads, a cooperating feeler, fixed plane guides upon which the feeler slides toward and from the detectors, an actuating rock-shaft operatively connected with the feeler, to vibrate it, a rotatable shaft having a feeler actuating cam and a tappet-cam thereon, a bunter-carrier operatively connected with the knock-off arm, a bunter pivotally mounted on the carrier and having a connected toe to

be engaged by the feeler-actuating cam, and
a link connected with the bunter and also
connected eccentrically with the rock-shaft,
to move the feeler in one direction, arrest of
5 the feeler by a detector operating to effect
engagement of the bunter and tappet-cam, to
thereby move the knock-off arm.

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

ALVAH W. CLEMENT.

Witnesses:

GEORGE OTIS DRAPER,
ERNEST W. WOOD.