

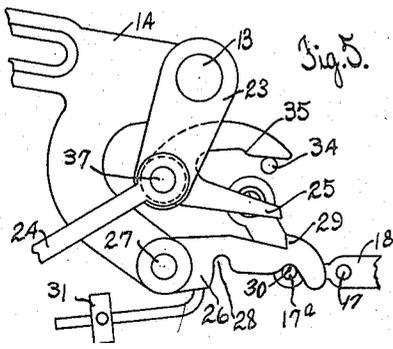
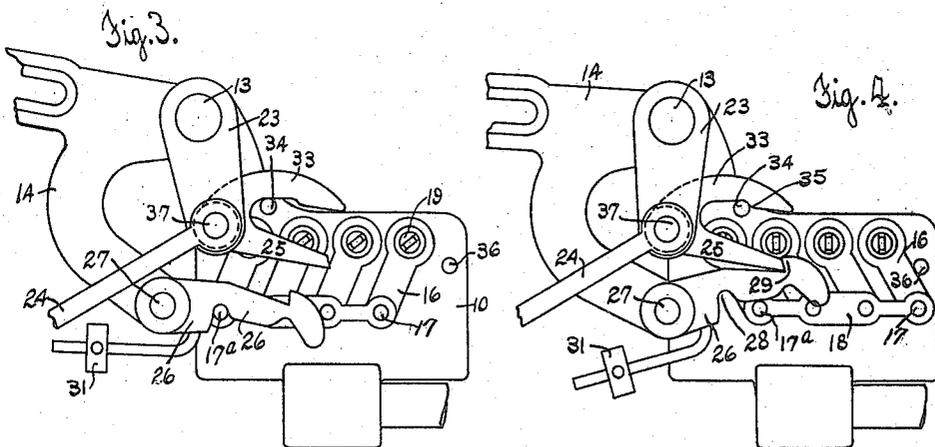
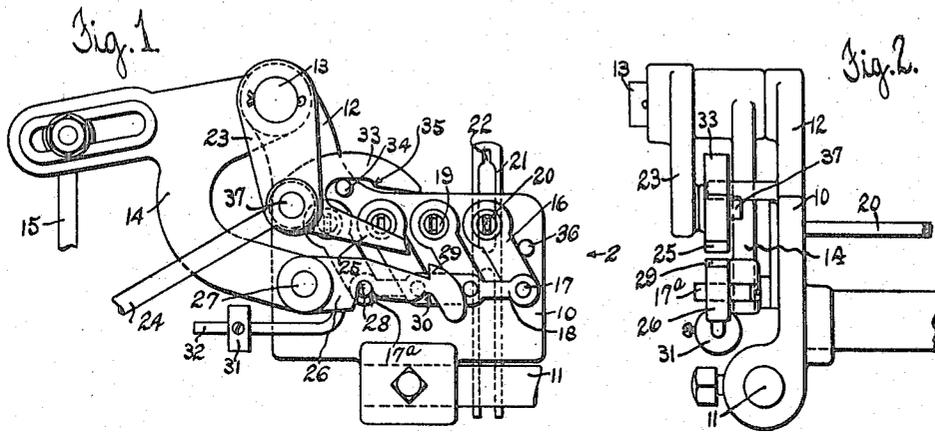
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1,515,895

R. G. TURNER

WARP STOP MOTION

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Inventor  
Richard G. Turner  
Southgate & Southgate  
Attorneys

# UNITED STATES PATENT OFFICE.

RICHARD GREENLEAF TURNER, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, OF WORCESTER, MASSACHUSETTS, A CORPORATION OF MASSACHUSETTS.

## WARP STOP MOTION.

Application filed November 25, 1922. Serial No. 603,326.

*To all whom it may concern:*

Be it known that I, RICHARD GREENLEAF TURNER, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented a new and useful Warp Stop Motion, of which the following is a specification.

This invention relates to warp stop motions of that type shown in the prior issue patent to Regan No. 14,829, and more particularly to improvements in the knock-off mechanism usually employed with this type of motion and shown in Patent No. 1,360,638 granted to Holmes.

In the type of warp stop motion referred to the drop wires or detectors are arranged in parallel banks, each drop wire having a slot the upper part of which is narrower than the lower part. A non-circular vibrator rod is associated with each bank of detectors and is free to oscillate in the lower part of the slots when the loom is running normally, but when a detector falls due to the slackening or breaking of the corresponding warp thread the narrow part of the slot engages the rod to prevent motion thereof, and mechanism is set in operation to stop the loom. The stopping mechanism usually employed is that shown in the Holmes patent above referred to and it is the principal object of this invention to actuate the vibrator rods shown in the Regan patent and the knock-off motion of the Holmes patent by means of a single member common to both.

Another object of the invention is to provide a pair of freely pivoted members separated during normal operation but brought into engagement when a fault occurs in the warp to effect stoppage of the loom, combined with means to separate the two members after they have been relieved of the strain incident to knock-off.

A further object of the invention is to provide means to restore the several parts of the motion to normal operating position after knock-off.

With these and other objects in view, the invention consists in certain arrangements and combinations of parts which will be

hereinafter described and more particularly pointed out in the claims.

In the drawings, where a preferred form of the invention is shown,

Fig. 1 is a side elevation of a warp stop motion embodying the invention,

Fig. 2 is a rear elevation looking in the direction of arrow 2, Fig. 1,

Figs. 3, 4 and 5 are diagrammatic views showing the parts in various positions.

Referring to Fig. 1, there is shown an end frame 10 supported by rod 11 carried by any convenient part of the loom (not shown). A horn 12 upstanding from the frame carries a stud 13 on which is pivoted a lever 14 given an oscillating motion by means of a reciprocating rod 15 driven from the bottom shaft of the loom (not shown). Arms 16 are provided with studs 17 which support connecting link 18 by means of which the arms are required to move in unison. Each arm has secured thereto a bearing 19 rotatably mounted in the frame 10 and slotted to receive one of the non-circular vibrator rods 20 already referred to as passing through the drop wires, (indicated at 21). The oscillation of lever 14 is communicated to the vibrator rods by devices to be described hereinafter, the vibrator rods being free to oscillate unobstructed when all the detectors are in raised position but being resisted when any one of them falls to permit the restricted part of the slot 22 to engage the vibrator rods.

Also pivoted on stud 13 is a knock-off lever 23 connected to knock-off rod 24 which extends to the loom shipper (not shown) to stop the loom whenever the knock-off lever moves to the left, referring to Fig. 1. A dog 25 pivoted to the lever 23 is engaged at warp fault to give the latter its knock-off motion. The matter thus far described is shown in the Holmes patent already mentioned, to which reference may be made for a more complete showing of the loom connections.

The improvements forming the subject matter of the present invention include an actuator 26 pivoted at 27 to the oscillating lever 14. One of the studs extending from

the arms 16 and link 18, as 17<sup>a</sup>, is lengthened to pass under the actuator and into notch 28 formed therein, as shown in Figs. 1 and 2. That side of the notch adjacent to pivot 27 is abrupt and when in engagement with stud 17<sup>a</sup> requires the latter to move to the right (as illustrated in Fig. 1) whenever lever 14 moves toward said stud. The opposite side of the notch is formed with an incline which will ride up on stud 17<sup>a</sup> when said stud is held against movement, this action resulting in raising the free end of the actuator and moving hook 29 formed thereon into engaging position with dog 25.

In order that the force required to lift the actuator may be varied there is provided a weight 31 adjustably mounted on rod 32 extending from the actuator.

The dog 25 has an overhanging arm 33 resting on support 34 fixed to the frame 10 and said arm 33 is provided with a cam face 35 which serves to raise the dog as the lever 23 moves to knock-off position. Lug 36 also fixed to frame 10 limits the motion of the arms 16 in a manner to be described.

Assuming the loom to be running normally, lever 23, rod 24 and dog 25 will be held to the right as shown in Fig. 1 and lever 14 will be given periodic oscillations. Actuator 26 moves back and forth with lever 14 and as long as the vibrator rods are free to rock, the weight of the actuator against stud 17<sup>a</sup> will be sufficient to maintain driving connections between lever 14 and the vibrator rods. Under these conditions the parts will move from the position shown in Fig. 1 to that shown in Fig. 3 and back again, this action continuing until a deflector falls and the rocking of the corresponding vibrator rod is resisted. When this occurs the stud 17<sup>a</sup> will remain in the position shown in Fig. 1 and the actuator, in moving on its working stroke to the left with lever 14, will be raised as previously described and hook 29 will engage dog 25 as shown in Fig. 4. Continued motion of lever 14 will move the parts to the position shown in Fig. 5, where it will be seen that rod 24 has been moved to knock-off position to stop the loom and that cam 35 and support 34 have raised the dog above the path of the hook. It will also be noted that as the actuator approaches the end of its knock-off stroke stud 17<sup>a</sup> passes into notch 30, formed in the actuator, to permit the latter to fall and move hook 29 away from dog 25.

When the usual types of loom shippers are in running position the stopping of the loom may be effected by giving the shipper an initial partial movement, after which the parts will continue to move to complete knock-off position. For this reason, when the parts assume the position shown

in Fig. 4, the dog will begin to move faster than the actuator and will pull away from the latter, so that cam 35 is not required to disengage the hook and dog as it lifts the latter.

The loom stops with the parts approximately in the position shown in Fig. 5, and after the warp fault has been repaired, the shipper (not shown) is pulled on, the result of which is to move rod 24 from the position shown in Fig. 5 to that shown in Fig. 1. Because of the spaced relation of the hook and dog, the latter moves beyond the hook without engagement therewith.

It will be noted that when starting the loom after stoppage because of warp fault, the stud 17<sup>a</sup> is in notch 30 and in order to prevent arms 16 from passing beyond their proper position the arm adjacent lug 36 engages the latter to arrest further motion of the arms, after which the notch 28 approaches stud 17<sup>a</sup> and the parts are restored to normal operating position.

From the foregoing it will be seen that the invention provides a very simple means for actuating both the vibrator rods and the knock-off mechanism, the normal working stroke of the actuator being accompanied either by oscillation of the vibrator rods or operation of the knock-off mechanism. It will also be seen that the actuator and dog each has a motion away from the other as these parts approach the limit of their knocking-off motion, thus permitting starting of the loom. Also, means is provided to restore the stud 17<sup>a</sup> and notch 28 to normal operative position.

It will be evident that changes and modifications can be made in the practice of the invention by those skilled in the art without departing from the spirit and scope thereof as set forth in the claims, and the invention is not to be otherwise limited to the details disclosed herein, but what is claimed is—

1. In a warp stop motion, a bank of drop detectors, a vibrator normally free to vibrate but arrestable by a fallen detector, a regularly moving member, a weighted actuator pivoted to the member, a support for said actuator movable and arrestable with said vibrator, knock-off mechanism, a dog pivoted on said knock-off mechanism, means to raise said weighted actuator out of driving contact with the support and into operative relationship with the dog when the vibrator and support are arrested by a fallen drop, and a fixed support for said dog independent of the knock-off mechanism to cooperate with a part of the dog to move the latter away from the actuator as the actuator nears the end of a knock-off stroke.

2. In a warp stop motion, a bank of drop detectors, an arrestable vibrator normally free to vibrate but arrestable by a fallen de-

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tector, a regularly moving member, a weight-  
 ed actuator pivoted to said member, a sup-  
 port for said actuator movable and ar-  
 restable with the vibrator and fitting into a  
 5 notch in the weighted actuator, knock-off  
 mechanism, means to move the actuator out  
 of driving contact with the support when  
 the vibrator is arrested by a fallen detector  
 and into operative relationship with the  
 10 knock-off mechanism, said actuator having  
 a second notch spaced from the first named  
 notch to receive the support when the latter  
 is arrested to permit said actuator to move  
 out of operative relationship with the knock-  
 15 off mechanism as the actuator nears the end  
 of its knock-off stroke.

3. In a warp stop motion, a bank of drop  
 detectors, an arrestable vibrator associated  
 therewith normally free to vibrate but ar-  
 20 restable by a fallen detector, a regularly re-  
 ciprocating actuator, knock-off mechanism  
 including a pivoted dog movable bodily with  
 the actuator, a fixed support for the dog, and

means formed on said dog to engage said  
 fixed support as said dog moves with the 25  
 actuator in a knock-off stroke to move the  
 dog away from the path of movement of  
 the actuator as the latter nears the end of  
 the knock-off stroke.

4. In a warp stop motion, a bank of drop 30  
 detectors, a vibrator therefor normally free  
 to vibrate but arrestable by a fallen detector,  
 a regularly moving member, a weighted ac-  
 tuator pivoted to the member, knock-off  
 mechanism, a support for the actuator mov- 35  
 able and arrestable with the vibrator, means  
 to move the actuator out of driving contact  
 with the support and into operative rela-  
 tionship with the knock-off mechanism when  
 the vibrator is arrested, and an adjustably 40  
 mounted counter-balance operatively connect-  
 ed to the actuator to vary the weight of the  
 same against the support therefor.

In testimony whereof I have hereunto af-  
 fixed my signature.

RICHARD GREENLEAF TURNER.