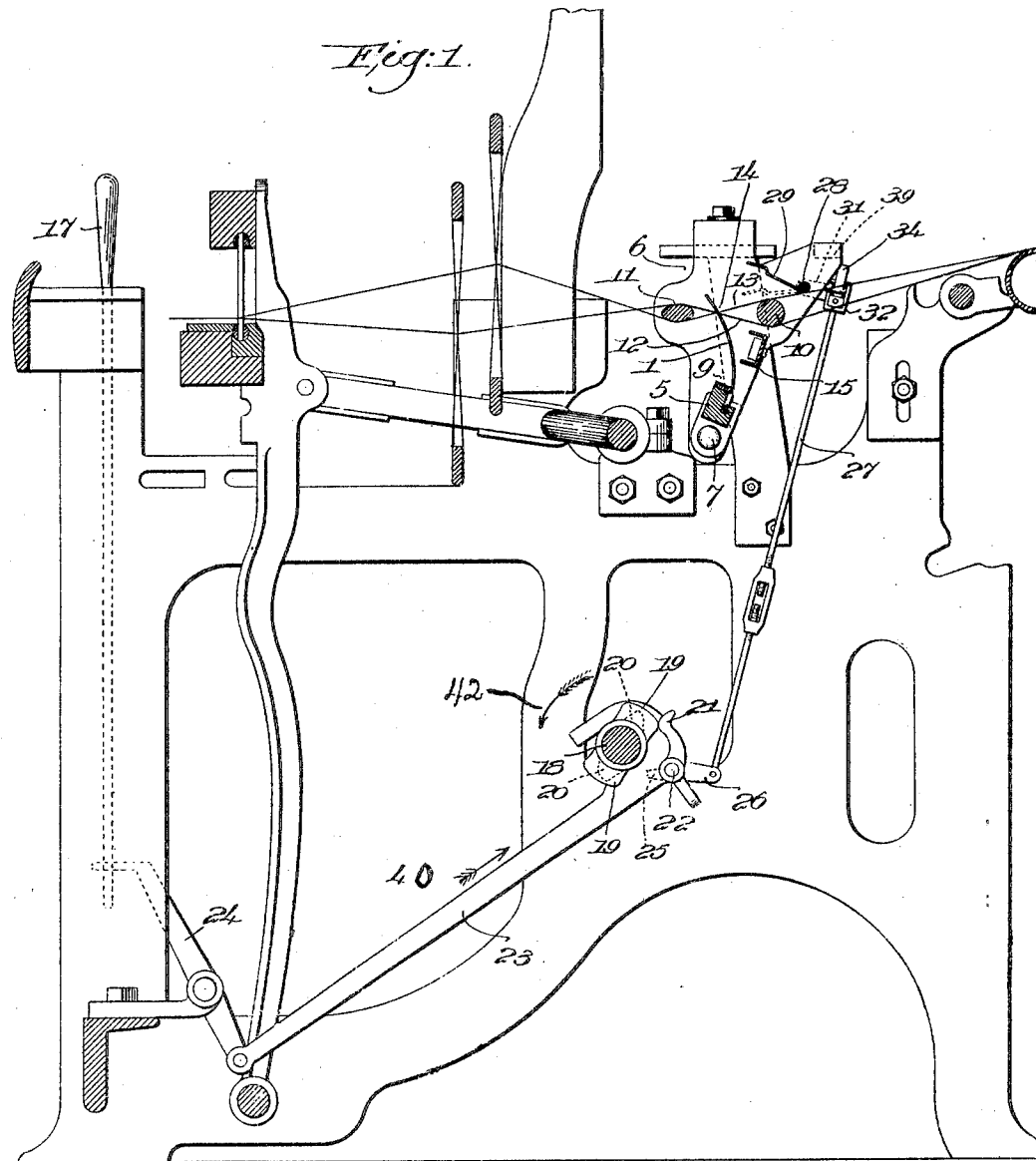
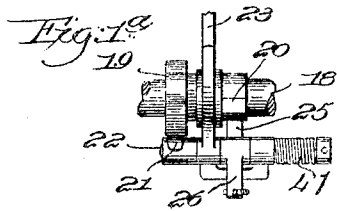


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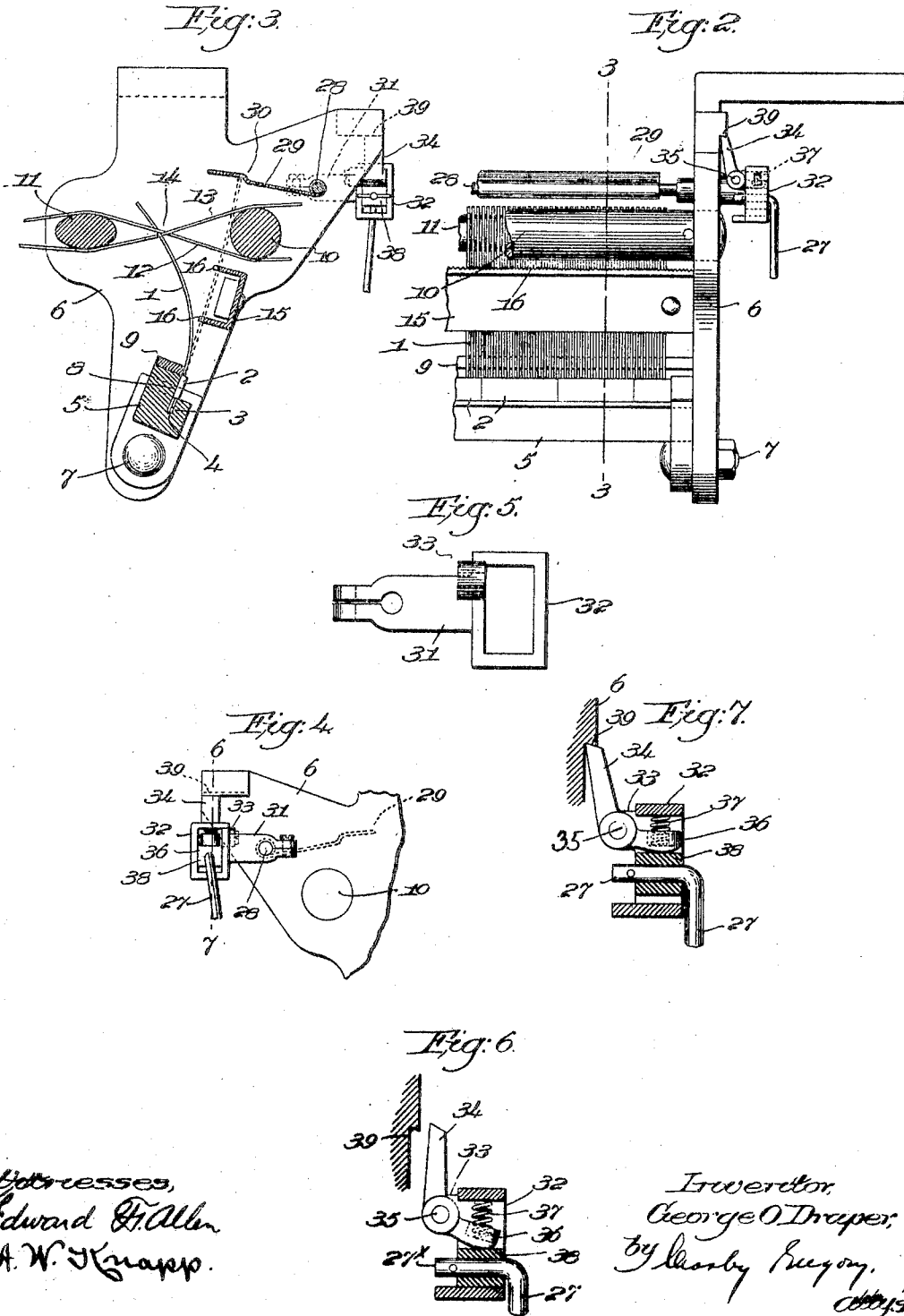


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UNITED STATES PATENT OFFICE.

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DRAPER COMPANY, OF HOPEDALE, MASSACHUSETTS, A CORPORATION
OF MAINE.

WARP-STOP-MOTION MECHANISM.

No. 797,671.

Specification of Letters Patent.

Patented Aug. 22, 1905.

Application filed March 15, 1905. Serial No. 250,142.

To all whom it may concern.

Be it known that I, GEORGE OTIS DRAPER, a citizen of the United States, and a resident of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Warp-Stop-Motion Mechanism, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

This invention relates to mechanism for indicating automatically the breakage or failure of a warp-thread and effecting the stoppage of a loom, warper, or similar apparatus.

In accordance with my invention means are provided to form a lease in the warp, dividing it into two groups, the threads of which cross each other, and a series of resilient or elastic detectors are extended through the crossed warps and engage pairs of threads at their crossing-points. The detectors are fixedly held at one end and free at their other ends, and they are so located that their free ends are normally flexed or bent by engagement with the crossed warps, so that when one or both warp-threads of a pair break or fail the released detector will spring into abnormal position.

Mechanical means are provided to effect the stoppage of the apparatus, said means including a vibrating member which is engaged and arrested by a released detector, the arrest of the vibrating member acting to effect the operation of the stopping instrumentality.

The construction is simple and effective, rapid and prompt in operation, and is unaffected by lint or fluff.

The various novel features of my invention embodied in one practical form will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a transverse sectional view of a sufficient portion of a loom to be understood, with one embodiment of my invention applied thereto. Fig. 1^a is a plan view to be referred to. Fig. 2 is an enlarged detail in rear elevation of the stop-motion mechanism. Fig. 3 is a vertical section thereof on the line 3 3, Fig. 2, looking toward the right. Fig. 4 is a side elevation of the connection between the vibrating feeler and the actuating-link, viewing Fig. 2 from the right hand. Fig. 5 is an enlarged detail of a portion of such con-

nection. Fig. 6 is an enlarged section on the line 6 7, Fig. 4, showing the parts in normal condition; and Fig. 7 is a similar view, but with the parts in the position assumed when the feeler is arrested.

Referring to Fig. 1, I have shown the warp-stop-motion detectors 1 extended transversely of the loom back of the harnesses, said detectors being made as resilient or elastic wires fixedly held at their lower ends and at their free ends extended through the warp. For convenience I arrange the detectors in groups, secured at one end in metal blocks 2, Figs. 2 and 3, the extremities of the wires projecting beyond the lower edges of the blocks at 3 to enter a groove 4 in a transverse sustaining-bar 5, rigidly held at its ends on brackets 6, mounted on the loom sides. The bar is set diagonally, as shown clearly in Figs. 2 and 3, and held in adjusted position by clamping-bolts 7, the bar being shaped to present a shoulder 8, against which bear the front faces of the blocks 2, and a cap-piece 9, fixed on the bar, acts on the upper edges of the blocks to retain them in place. This construction and arrangement affords a convenient method of assembling and sustaining the detectors, the several groups being alined across the loom.

I have mounted leasing members 10 and 11 on the brackets 6 to divide the warp into groups and effect the crossing of the threads between the members 10 11, the thread 12 of one group of threads crossing the thread 13 of the other group at 14, Fig. 3. As herein shown, the threads 13 pass over the leasing member or rod 10 and forward under the member 11, while the threads 12 pass under the rod 10 and over rod 11. The base-bar 5 is so located that when the warps are intact the free ends of the detectors will engage the pairs of threads at their crossing-points and will be bent or flexed forward in full-line position, Fig. 3. When either or both threads of a crossed pair fail, the cooperating detector is released, and by virtue of its resilience or elasticity it springs back into dotted-line position against the leasing member 10 and a back rest or support 15, extended transversely behind the detectors between the bar 5 and the lease-rod 10, said support 15 presenting two parallel toothed or serrated edges 16 to receive a released detector.

I will now explain a convenient mechanism for effecting automatic stoppage of the appa-

ratus by or through a released detector, and, referring to Fig. 1, the shipper 17, of usual construction, is arranged in any well-known manner to throw the power on or off the apparatus. The cam-shaft 18, rotated in the direction of arrow 42, Fig. 1, is provided with a double feeler-actuating cam 19 and a double tappet-cam 20, the cam 19 acting on a follower 21 twice for each revolution of the cam-shaft, the follower being fulcrumed at 22 on a rod 23, bent to embrace the cam-shaft, and at its lower end being connected with a knock-off lever 24 for the shipper. A bunter 25, movable with the follower 21, (see dotted lines,) is adapted to be engaged by one of the tappets 20 when the follower is prevented from moving toward the low part of the cam 19, as will be explained, the follower having an arm 26 pivotally connected with the lower end of a link 27. A rock-shaft 28 is mounted in the brackets 6 above the lease-rod 10, so that it will be above the warp, and on said rock-shaft is secured a feeler 29, conveniently made as a metal plate extended transversely of the loom and normally vibrating up and down from full to dotted line position, Fig. 1. When a detector is released, however, it snaps into dotted-line position, with its upper end in the feeler-path, and the feeler on its downward or feeling stroke will engage and be arrested, as shown in Fig. 3, the slight longitudinal strain on the engaged detector tending to bend it being counteracted by the cooperation of the support or back-stop 15 and the lease-rod 10 and by a bend or shoulder 30 in the feeler. Such arrest of the feeler is made effective to cause shipper release automatically by means now to be described. At one end the feeler rock-shaft has attached to it an arm 31, (shown separately in Fig. 5,) the arm having a box-like housing 32 and an ear 33, projecting at right angles to the side of the arm to support a stop, shown as a dog 34, fulcrumed at 35 on the ear, Figs. 6 and 7, and having a tail 36 extended into the housing. The tail has a recess to receive a spring 37, interposed between the tail and the top of the housing and normally acting through the tail to retain a sliding block 38, seated on the bottom of the housing, as in Fig. 6, the upper end of the link 27 being bent at 27^x to loosely enter a hole in the block. A yielding connection between the link 27 and the feeler is thus provided, the spring 37 being strong enough to seat the block 38 under normal conditions, so that block, arm 31, and housing 32 move in unison, with the rock-shaft 28 as a fulcrum. The adjacent bracket 6 is provided with an overhanging shoulder 39, and normally the stop-dog 34 moves up and down clear of the shoulder; but if the feeler is arrested on its downward stroke, thereby holding the arm 31 stationary, the then upward movement of the link 27 will compress the spring 37, the block 38 lifting the tail 36 and throwing the stop into engagement

with the shoulder 39, as in Fig. 7, preventing any further upward movement of the link. Such stoppage of the latter acts to hold the bunter 25 in position to be engaged by a tappet 20, and thereby the rod 23 is moved in the direction of arrow 40, Fig. 1, to actuate the knock-off lever 24 and release the shipper.

As shown in Fig. 1^a, a spring 41 serves to move the follower 21 toward the cam-shaft 18 and to move the link 27 upward to impart the feeling stroke to the feeler, the spring being strong enough to compress the spring 37 when the feeler is arrested by a released detector. This mechanism between the shipper and the block 38 on the feeler-arm is not of my invention *per se* and is of well-known construction.

Any other suitable mechanism for effecting the normal vibration of the feeler and for automatically effecting stoppage of the apparatus by or through arrest of the feeler may be used instead of that herein shown.

When the loom is running properly, the upper ends of the flexed detectors will all be bent forward toward the front of the loom, and when a detector is released it at once springs back into abnormal position, indicating at once the position of the pair of warp-threads in fault.

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

1. In warp-stop-motion mechanism, in combination, leasing members, a series of resilient detectors normally flexed by engagement with pairs of warp-threads at their crossing-point between the leasing members, and a vibrating feeler adapted to engage and be arrested by a detector released by failure of one or both of its controlling-warps, arrest of the feeler being adapted to effect the operation of a stopping instrumentality.

2. In warp-stop-motion mechanism, in combination, means to cross the warp-threads, in pairs, a series of resilient detectors fixed at one end and normally flexed by engagement at or near their free ends with pairs of warp-threads at their crossing-points, a vibrating feeler adapted to engage and be arrested by a released detector, such arrest of the feeler being adapted to effect the operation of a stopping instrumentality, and a support for the detectors when released.

3. In warp-stop-motion mechanism, in combination, means to cross the warp-threads in pairs, a series of resilient detectors fixed at one end and normally flexed by engagement at or near their free ends with pairs of warp-threads at their crossing-points, a vibrating feeler adapted to engage the tip of and be arrested by a released detector, and means to support a released detector between its fixed end and the feeler, arrest of the latter being adapted to effect the operation of a stopping instrumentality.

4. In warp-stop-motion mechanism, in com-

bination, a pair of lease-rods to cross the warp-threads, a series of resilient detectors normally flexed by intersecting pairs of warp-threads and engaging the same at their crossing-points, a shipper, and mechanical releasing means therefor, including a vibrating member arrested by engagement with a released detector.

5. In warp-stop-motion mechanism, in combination, leasing members to cross the warp-threads between them, a series of resilient detectors fixedly held at one end and having their free ends passed through the threads, the detectors engaging pairs of threads at their crossing-points and being thereby normally flexed, a shipper, releasing means therefor including a movable member adapted to engage and be arrested by a released detector, and means to support a released detector near its point of engagement with said movable member.

6. In warp-stop-motion mechanism, in combination, leasing members to cross the warp-threads between them, a series of upturned, resilient detectors fixedly held at their lower ends below the warp and having their free ends passed through and engaging pairs of threads at their crossing-points, to be thereby normally flexed, a shipper, and releasing means therefor including a vibrating feeler located above the warp and adapted to engage and be arrested by the free end of a released detector.

7. In warp-stop-motion mechanism, in combination, means to cross the warp-threads in pairs, a plurality of groups of resilient detectors fixedly connected at their lower ends and mounted in alinement across the loom, the free ends of the detectors engaging pairs of threads at their crossing-points and being normally flexed thereby, a vibrating feeler to engage and be arrested by a released detector, and shipper-releasing means actuated by or through arrest of the feeler.

8. In a warp-stop-motion mechanism, a series of resilient detectors normally engaged and flexed by pairs of warp-threads, a cooperating feeler, means to vibrate it, including a reciprocating link and a yielding connection between it and the feeler, a bunter controlled by the link, and a stop for the latter rendered operative through said yielding connection when the feeler is arrested by engagement with a released detector, combined with shipper-releasing means operated through the bunter when operatively positioned by stoppage of the link.

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

GEORGE OTIS DRAPER.

Witnesses:

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