

J. NORTHRUP.
 WARP STOP MOTION FOR LOOMS.
 APPLICATION FILED DEC. 9, 1910.

1,045,170.

Patented Nov. 26, 1912.

3 SHEETS—SHEET 1.

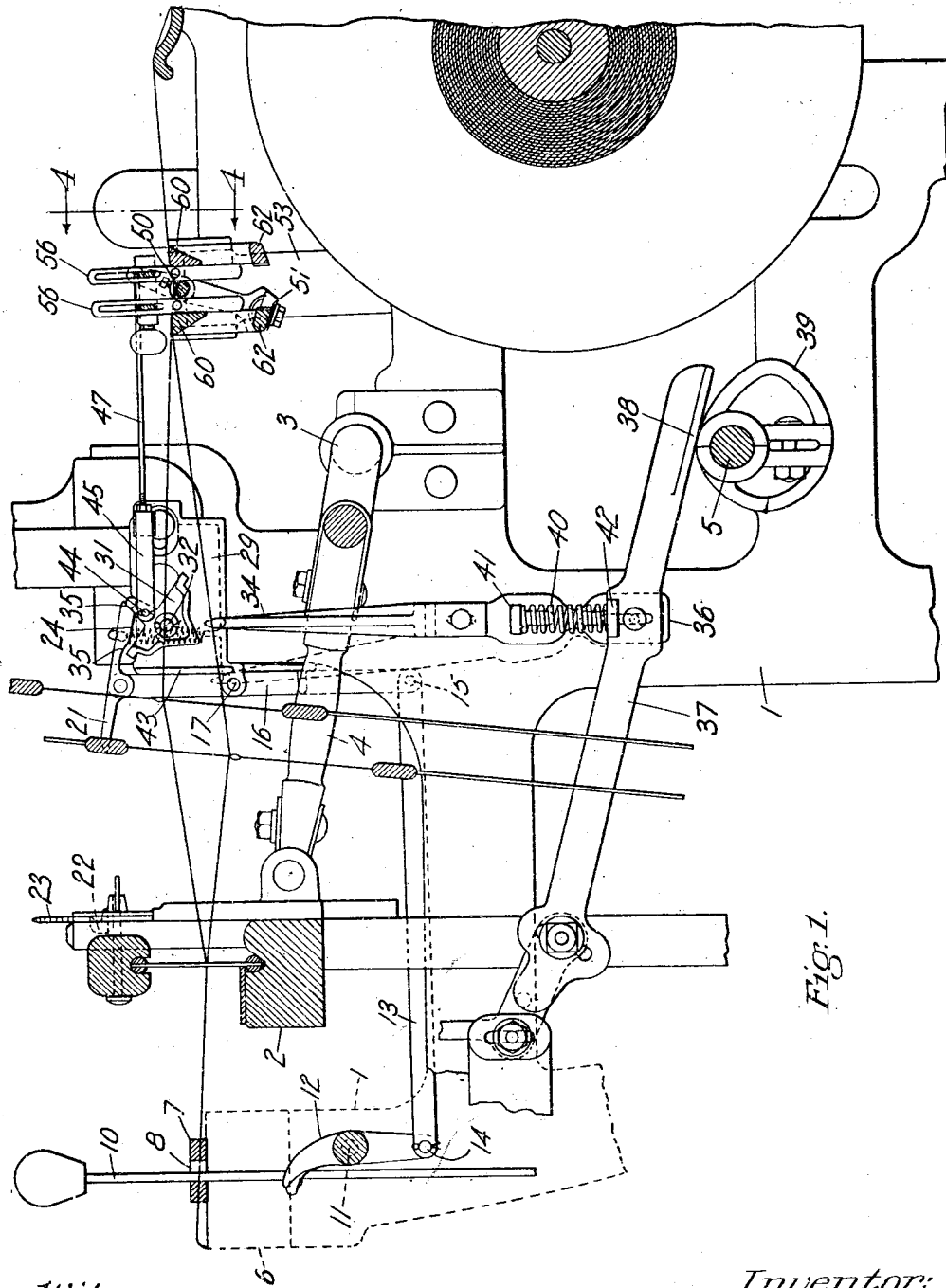


Fig. 1.

Witnesses:
 Camille E. Parker
 Amelia M. Ross

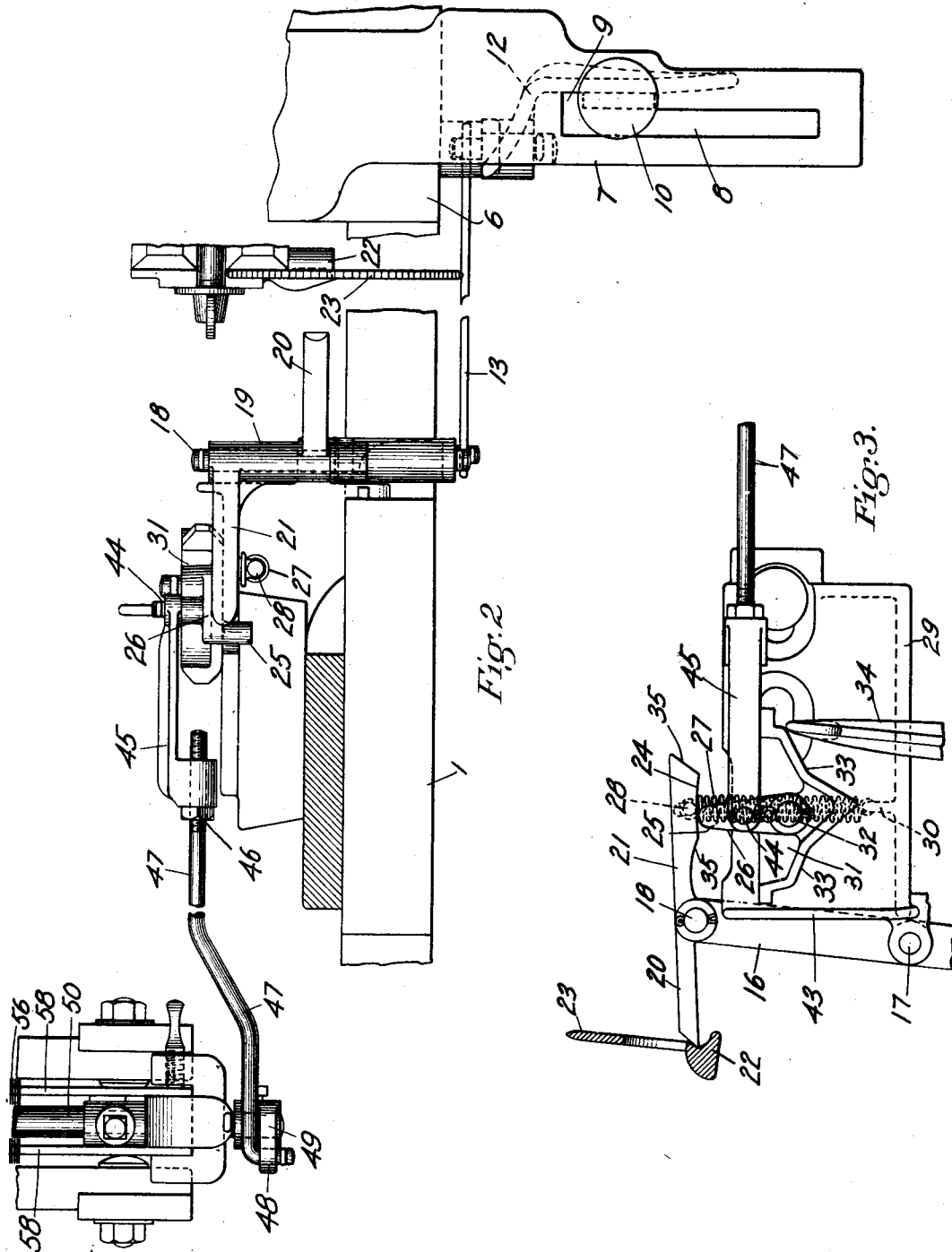
Inventor:
 Jonas Northrop
 by Robt P. Harris.
 Att'y

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3 SHEETS—SHEET 2.



Witnesses:

Carrie L. Parker.
 Amelia M. Rose.

Inventor:

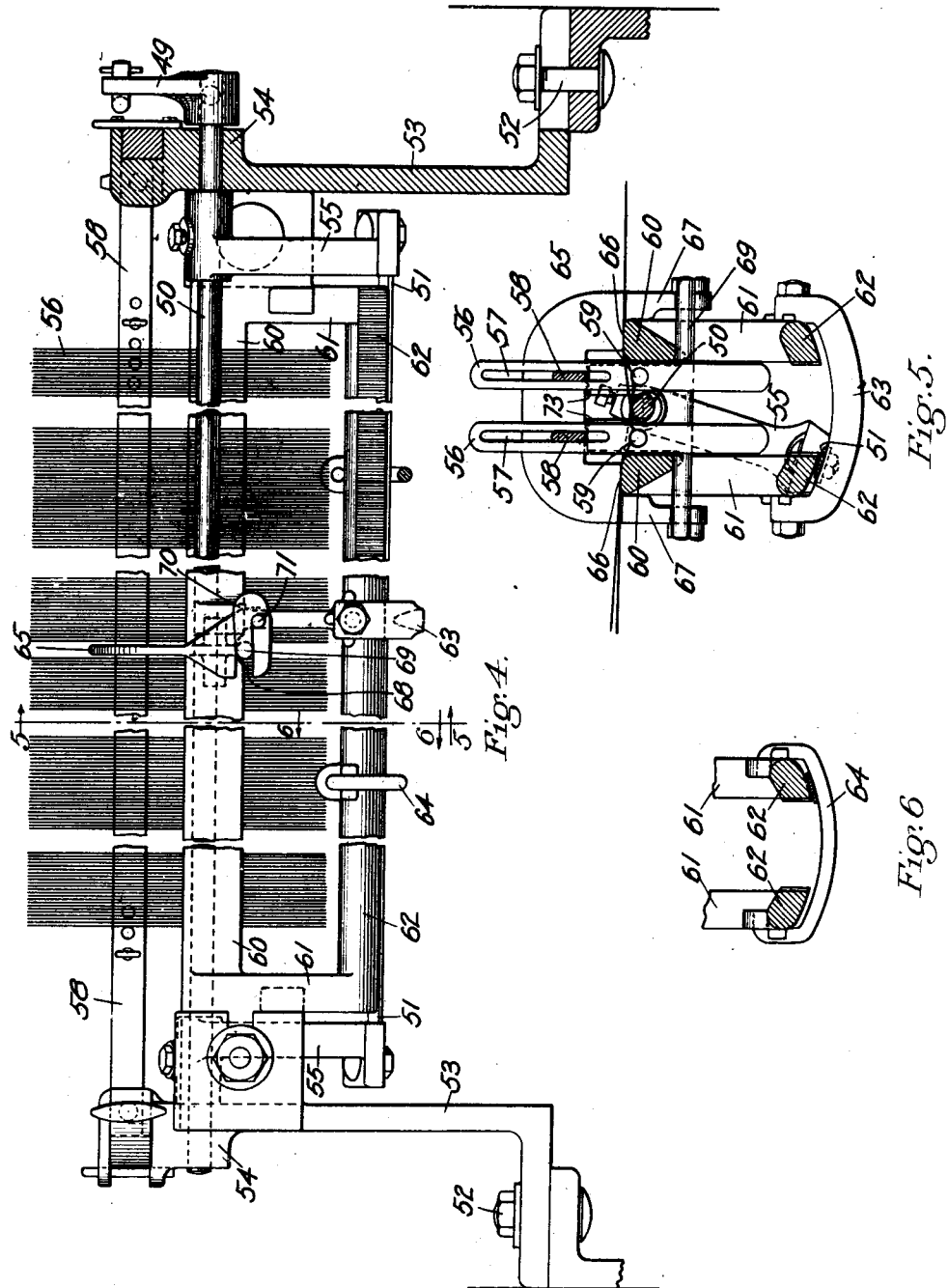
Jonas Northrop
 by Robt. D. Hains.
 Atty.

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3 SHEETS—SHEET 3.



Witnesses:

Charles L. Barker.
Amelia M. Ross

Inventor:

Jonas Northrop
by Robt. P. Hains
Att'y.

UNITED STATES PATENT OFFICE.

JONAS NORTHRUP, OF HOPEDALE, MASSACHUSETTS, ASSIGNOR, BY MESNE ASSIGNMENTS, TO DRAPER COMPANY, A CORPORATION OF MAINE.

WARP STOP-MOTION FOR LOOMS.

1,045,170.

Specification of Letters Patent.

Patented Nov. 26, 1912.

Application filed December 9, 1910. Serial No. 596,407.

To all whom it may concern:

Be it known that I, JONAS NORTHRUP, a citizen of the United States, residing at Hopedale, in the county of Worcester and 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 on the drawings representing like parts.

The invention to be hereinafter described relates to looms, and more particularly to the warp stop motion which is utilized to bring the loom to rest upon the occurrence of an objectionable warp fault.

In a prior application, Serial No. 576,796, filed August 12, 1910, there was shown, described and claimed a warp stop motion, wherein the relation of parts was such that not only was the shuttle caused to occupy the same box each time the loom was stopped owing to a warp fault; but, when first operating the loom after putting in a new set of warps, the warp stop motion could be readily made inoperative to enable the loom to run for a time without stopping owing to a warp fault. This enables the "loom tender" to piece up the many broken ends and get the warp in proper condition before commencing to weave commercially, and to do this without constantly having the loom stopped. In the said prior application, also, the relation of the feeler and its actuator was such as to permit each to be independently moved, so that should the loom be stopped by a warp fault, the operative could move the feeler by hand, clamp the dropped detector, and by running his hand over the loose detectors, could at once locate the clamped detector and, perforce, the broken or loose warp thread.

The aims and purposes of the present invention are closely related in these respects to the invention of the said prior application; and, in addition, seek to simplify the operation and construction, all of which, and other objects of the invention will best be made clear from the following description and accompanying drawings of one form or embodiment of the invention, which, in its true scope, is defined by the claims.

In the drawings:—Figure 1 is a central vertical section from front to rear of a loom

provided with one form of the present invention, only so much of the loom structure being shown as is necessary to disclose the relation of parts; Fig. 2 is an enlarged top or plan view of one side of the loom, showing parts of the warp stop motion and connection with the feeler, and drop wires; Fig. 3 is a detail showing some of the parts as they appear related when the loom is to be stopped by a warp fault; Fig. 4 is a transverse sectional and enlarged view on the line 4—4 of Fig. 1, some of the parts being broken away to more clearly show the construction; Fig. 5 is a section on the line 5—5 of Fig. 4, showing the detectors, the feeler, the center support, and other details; and Fig. 6 is a detail sectional view on line 6—6 of Fig. 4.

The loom frame 1, the lay 2, the crank shaft 3, the connection 4 between the crank shaft and lay, the bottom or cam shaft 5, the breast beam 6, the bracket 7 having the slot 8 and holding notch 9 for a shipper handle 10, may be of usual or any preferred construction suitable to the purposes intended. Pivotaly connected at 11 to the loom frame is a knock-off lever 12, one end whereof lies in front of the shipper handle 10, Figs. 1 and 2, and the other end is connected to a knock-off actuator, the construction being such that upon movement of the actuator in a manner hereinafter described, the knock-off lever will be moved clockwise, viewing Fig. 1, and release the shipper handle 10 from its holding notch, whereupon the loom will be brought to rest.

In the present form of the invention, the actuator for the knock-off lever 12 comprises a link 13 connected to the lever 12, at 14, and at its opposite end joined at 15 to the lower end of a lever 16, pivoted at 17 to a suitable bracket or support. At its upper end the lever 16 carries a dagger, which, upon a warp fault, is adapted to be actuated by the lay to move the knock-off lever, as will be evident.

In the construction shown, the lever 16 carries at its upper portion a stud or pin 18 upon which is mounted the rocking sleeve 19 having operatively connected thereto the dagger 20 and the finger 21. Secured to the lay is a bunter 22, which, on the backward movement of the lay, will engage the end of

the dagger 20, provided such end be in the path of the bunter, a condition that occurs when a warp fault is present, as will hereinafter appear. The bunter 22 may be provided with a guard plate 23, to prevent the operative getting his hand accidentally between the bunter and dagger, but this may be omitted, if desired.

The under surface of the finger 21, Fig. 3, is provided with a bearing portion 24 which rests upon a lifter 25, said lifter in the present form of the invention comprising a stud, projection, or roll mounted on the rocking arm 26. A spring 27 connected to the finger 21 at 28 and to the bracket 29 at 30 normally forces the rear portion of the finger downward and upon the lifter 25.

The rocking arm 26 is connected to a rocking wiper or member 31 pivotally mounted at 32 upon the bracket 29 secured to the loom frame. The rocking wiper or member 31 has at each side of its pivotal connection with the bracket 29, the cam or incline portions 33, which co-act with an actuator 34, so mounted and operated that it will upon one upward movement engage one of said cam portions 33 and turn the wiper 31 in one direction, and on the next upward movement will engage the other cam portion 33 and turn the wiper in the opposite direction, see Fig. 1.

From the construction thus far described, it will be apparent that when the rocking actuator 31 is rocked first in one and then in the opposite direction, the lifter 25 will pass from the bearing portion 24 of the finger 21 and engage either of the end cam portions 35 on the finger, permitting the finger to respond to the demands of the spring 27 and, perforce, rock the sleeve 19 with consequent raising of the dagger 20 to remove it from the path of the bunter 22. When the parts operate in the manner stated, and the rocking actuator 31 is not prevented from the movements described, the loom will continue to run, but should the rocking wiper 31 be prevented from movement, a condition that will occur when a warp fault is present, then the lifter 25 will remain in contact with the bearing surface 24 of the finger and hold the dagger 20 in the path of movement of the bunter 22 on the lay, with the result that as said lay moves back, the bunter will contact with the dagger, rock the lever 16 clock-wise, and correspondingly move the knock off lever 12 to disengage the shipper handle 10 from its holding notch, thereby stopping the loom.

It is desirable at times to run the loom with the warp stop motion inoperative. In the present form of the invention, therefore, the actuator for the rocking wiper 31 comprises an arm 34 having a foot portion 36 extending beneath a bearing portion on the lever 37, said lever in the present form, of

the invention preferably comprising the weft fork actuating lever, the end portion 38 of which is in coöperative relation with the cam 39 on the cam shaft 5, as will be readily understood by those skilled in the art.

The foot portion 36 is maintained in yielding engagement with the bearing portion of the lever 37 by means of a spring 40, one end of which engages a seat 41 on the actuator 34, while the other end thereof engages a seat 42 on the lever 37, the construction being such that said actuator 34, while normally maintained by the spring 40 in operative relation with the rocking wiper 31, may be readily moved by the hands of the operative from full to dotted line position, Fig. 1, with the end of the actuator 34 in front of the guide 43 secured to the bracket 29. In this dotted line position of the parts, it will be noted, Fig. 1, that while the bunter and dagger are maintained in position not to cause stoppage of the loom, the actuator 34 will be moved up and down in front of the guide 43 without effecting movement of the rocking wiper 31.

Connected to the rocking wiper 31, as at 44, is an arm 45 adjustably connected at 46 to a rod 47 which is itself jointed at 48, Figs. 1 and 2, to a crank arm 49 secured to the rocking feeler rod 50, the construction being such that upon rocking movement of the wiper 31, the feeler rod 50 will be similarly rocked, as will also be the feeler 51 connected thereto, as will presently appear. Adjustably connected to the loom sides by means of bolts 52, Fig. 4, are the brackets 53, having bearings 54 at their upper portions for the rocking feeler rod 50, Fig. 4. Secured to the feeler rod 50, preferably at either end thereof, is the depending arm 55 and between the lower extremities of the arms 55 is the feeler 51 which is adapted to coöperate with the detectors 56 in a manner that will presently appear. The detectors 56 may be of any usual character and herein they are formed as flat pieces of metal having slots 57 to engage the guide bars 58, said detectors having perforations at 59 for the passage of warp threads.

It will be noted from Fig. 5 that the feeler rod 51 is disposed between the detectors 56, said detectors being arranged in two rows, as indicated by Figs. 4 and 5, the construction being such that the feeler rod 51 serves to separate the two series of detectors, one series or row of detectors being disposed between the feeler rod and the side bar 60 and the other row of detectors being disposed between the feeler rod 51 and the opposite side bar 60, as clearly shown by Fig. 5. The warp threads pass from the bars 60 each through an eye 59 of one of the detectors, said warp threads also passing above the feeler rod 50. Since the feeler rod 50

is formed non-circular in cross-section, it will be noted that upon each rocking movement thereof, the warp threads will be agitated or raised, thereby preventing that frequent cause of annoyance in warp stop motions, to wit, stopping of the loom by a slightly slack warp thread.

Depending from the side bars 60 which extend between the brackets 53 are the arms 61, Figs. 4 and 5, and between the lower extremities of these arms 61 extend the side bars 62, the inner surfaces of which may be serrated, if desired, and as indicated in Figs. 4 and 5. The feeler 51, as hereinbefore noted, comprises a strip, preferably of light material such as sheet metal, extending between the arms 55 which depend from the feeler rod 50, and in order to support the central portion of this feeler 51, there is a bridge-piece 63, Fig. 5, preferably secured to the side bars 62, and serving as a rest for the central portion of the feeler 51 as the same moves between the side bars 62, as will be evident to those skilled in the art. If desirable, the feeler 51 may be further supported by additional bridge pieces 64, Fig. 6, secured to the side bars 62 at intermediate points, but these are not always necessary. It is desirable to additionally support the detector guide rods, which are usually light and easily bent or deflected, and to this end the present invention contemplates a novel form of center support supplemental to the end supports by means of the bracket 53, to which the guide rods 58 are secured. In the present form of this feature of the invention, the center support comprises an upper arch piece 65 having slots for the passage of the rods 58 and seats 66, Fig. 5, resting on the upper side bars 60. The lower leg portions 67 extend slightly below the upper side bars 60 and are each provided with a slot 68, Fig. 4, which are adapted to be engaged by a transverse rod 69 having hooked portions 70 to engage and interlock with pins 71 on the legs 67, the construction being such that when the arch piece 65 is put in position and the slotted leg portions are engaged by the rod 69 below the side pieces 60, the hooked portions 70 of the transverse rod may be turned to engage the pins 71 and lock the parts securely in position without the use of bolts, screws, or other form of fastening devices which are difficult if not impossible to manipulate while the warp is in the loom. The transverse rod 69 may have a lower bearing support 72 to engage beneath and support the feeler rod 50, and upwardly extending lug portions 73 on the transverse rod 69 may engage beneath the guide rods 58.

From the construction described, it will be noted that the feeler 51 is given an amplitude of movement to cause it to pass beyond the inner edges of the lower side bars 62 be-

fore the riser 25 passes from the bearing surface 24 of the finger 21, the effect being that not only will the loom be stopped when a detector is in lower position and its edge portions are engaged by the feeler and one of the lower side bars 62, but such stopping of the loom will occur even though the detector should turn to present its flat sides to the feeler and side bar.

It will be noted that the feeler rod 50 acts upon the warp threads at each rocking movement to lift said threads and prevent unnecessary loom stoppage; and since the feeler rod and feeler are assembled in the relation noted with the rod above the feeler, the detectors and adjacent parts may be placed near the rear of the loom or closer to the warp beam; and that the parts including the rocking wiper, actuator, and associated elements are at the side of the loom and not below the warp so that they are readily accessible.

What is claimed is:

1. In a warp stop motion for looms, the combination of a series of warp detectors, a feeler, means for moving the feeler to cause it to engage and be stopped by a detector in abnormal position, a lever, a finger and dagger pivotally mounted on said lever, said finger having a bearing surface, a rocking lifter connected to said means for acting on the surface of said finger and to pass from said surface to permit the dagger to move out of operative position during movement of the feeler and to remain in contact with said surface and hold the dagger in operative position when the feeler movement is stopped upon the occurrence of a warp fault.

2. In a warp stop motion for looms, the combination of warp detectors, a feeler, a rocking member connected to and for moving the feeler, means for actuating the rocking member, a lever, a finger and dagger mounted on said lever, a lifter movable with the rocking member beneath the said finger to cause the dagger to be moved out of operative position during feeler movement and to remain in operative position when the feeler is arrested by a detector, and means normally acting to move the finger toward the rocking lifter.

3. In a warp stop motion for looms, the combination of a series of warp detectors, a feeler, devices coöperating with the feeler to cause it to engage and be stopped by a warp detector in abnormal position, an actuator for said devices movable into and out of operative relation therewith, and means independent of said devices for engaging and holding the actuator in inoperative relation to said devices.

4. In a warp stop motion for looms, the combination of a series of warp detectors, a feeler, a rocking member connected to and

- for operating the feeler, a lever pivotally mounted in rear of the lay, a finger and dagger pivotally mounted on the lever, and stop devices connected to said lever, said finger having a bearing surface and a cam portion at each end of said surface, a rocking lifter movable over said bearing surface and said cam portions, and means on the lay to engage the dagger when the rocking lifter fails to move from the bearing surface of the finger.
5. In a warp stop motion for looms, the combination of a series of warp detectors arranged in rows, a feeler rod non-circular in cross-section disposed between the rows of detectors and serving to support the warp threads between the rows of detectors, a feeler connected to said rod, and means for oscillating said rod and feeler, and cause the warp threads to be lifted at each detecting action of the feeler.
6. In a warp stop motion for looms, the combination of plural rows of warp detectors, a support for the warp threads between said rows of detectors, and means for causing said support to periodically raise the warp threads to prevent loom stoppage due to negligible slackness in a warp thread.
7. In a warp stop motion for looms, the combination of a series of warp detectors, guide rods on which said detectors are mounted, means for supporting the end portions of said guide rods, a support for the guide rods intermediate the ends thereof, said support comprising two interengaging members, and a catch for detachably holding the parts in supporting position.
8. In a warp stop motion for looms, a frame, extending transversely of the loom and comprising side bars, a series of warp detectors disposed between the side bars, guide rods for said detectors, an intermediate support for said guide rods resting on said side bars, and a clamp for holding the intermediate support in position.
9. In a warp stop motion for looms, a frame extending transversely of the loom and comprising side bars, a series of warp detectors disposed between the side bars, guide rods for said detectors, an intermediate support for said guide rods comprising an upper member resting on the side bars, a lower member beneath the side bars, and a catch for detachably connecting the upper and lower members.
10. In a warp stop motion for looms, a series of warp detectors, a feeler, a rocking member for oscillating the feeler, a rod connecting the feeler and rocking member, an actuator disconnected from the rocking member, and means permitting the actuator to engage the rocking member at either side of its rocking fulcrum.
11. In a warp stop motion for looms, a series of warp detectors, a feeler, a rocking member for oscillating the feeler, a rod connecting the feeler and rocking member, an actuator disconnected from the rocking member, means permitting the actuator to engage the rocking member at either side of its rocking fulcrum, and means independent of the rocking member to hold the actuator out of operative relation with respect to the rocking member.
12. In a warp stop motion for looms, the combination of a series of warp detectors, a feeler, means including a rocking member and an actuator therefor disconnected therewith for causing the feeler to engage and be stopped by an abnormally positioned warp detector, a dagger adapted to be moved by the lay on its rearward movement, a finger for controlling the position of the dagger, and devices between the said means and finger to hold the dagger in position to be moved by the lay until after the feeler has passed the transverse vertical plane extending through the warp detectors.
13. In a warp stop motion for looms, a series of warp detectors, a feeler, a rocking member for actuating the feeler, an actuator for the rocking member disconnected therefrom and movable into contact therewith, a pivotally mounted lever, a dagger pivoted on said lever, the lay having a bunter, and means connected to the rocking member for causing the dagger to be engaged by the bunter and the said lever to be turned on its pivot to stop the loom when the feeler is stopped by a detector.
14. In a warp stop motion for looms, the combination of a series of warp detectors, a feeler, a rocking member, a rod connecting the feeler and rocking member, an actuator for the rocking member disconnected therefrom, and a fixed guide adapted to direct the movement of the actuator into inoperative relation with the rocking member.
15. In a warp stop motion for looms, a pivoted lever adapted by its movement to stop the loom, a dagger movably mounted on said lever, a lay having a bunter, and a rocking member having a part to move the dagger into position to be struck by the bunter, said dagger having connected cam portions to permit movement of the dagger into inoperative position when said part is withdrawn by movement of the rocking member.
16. In a warp stop motion for looms, the combination of a series of warp detectors, a feeler, a rocking member, a rod connected to the rocking member and feeler, and an actuator for the rocking member adapted to alternately engage the rocking member at opposite sides of its rocking fulcrum.
17. In a warp stop motion for looms, the combination of a series of warp detectors, a feeler, a rocking member, a rod connected to the rocking member and feeler, an actuator

for the rocking member adapted to alternately engage the rocking member at opposite sides of its rocking fulcrum, and a guide adjacent the rocking member to be engaged by
5 the actuator to maintain it in inoperative relation with said rocking member.

In testimony whereof, I have signed my

name to this specification, in the presence of two subscribing witnesses.

JONAS NORTHROP.

Witnesses:

WENDELL WILLIAMS,
BERTHA I. SNARE.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."