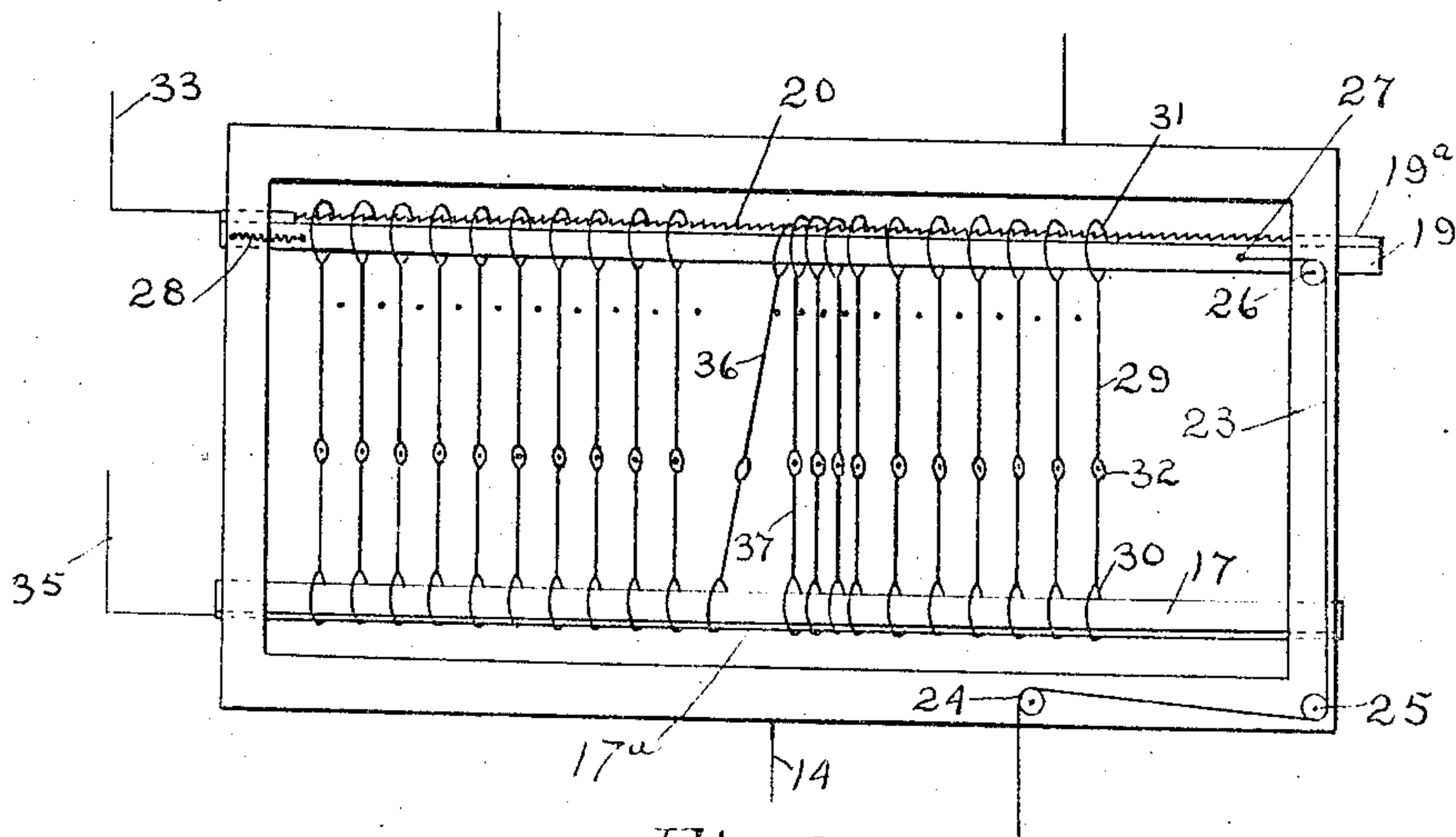
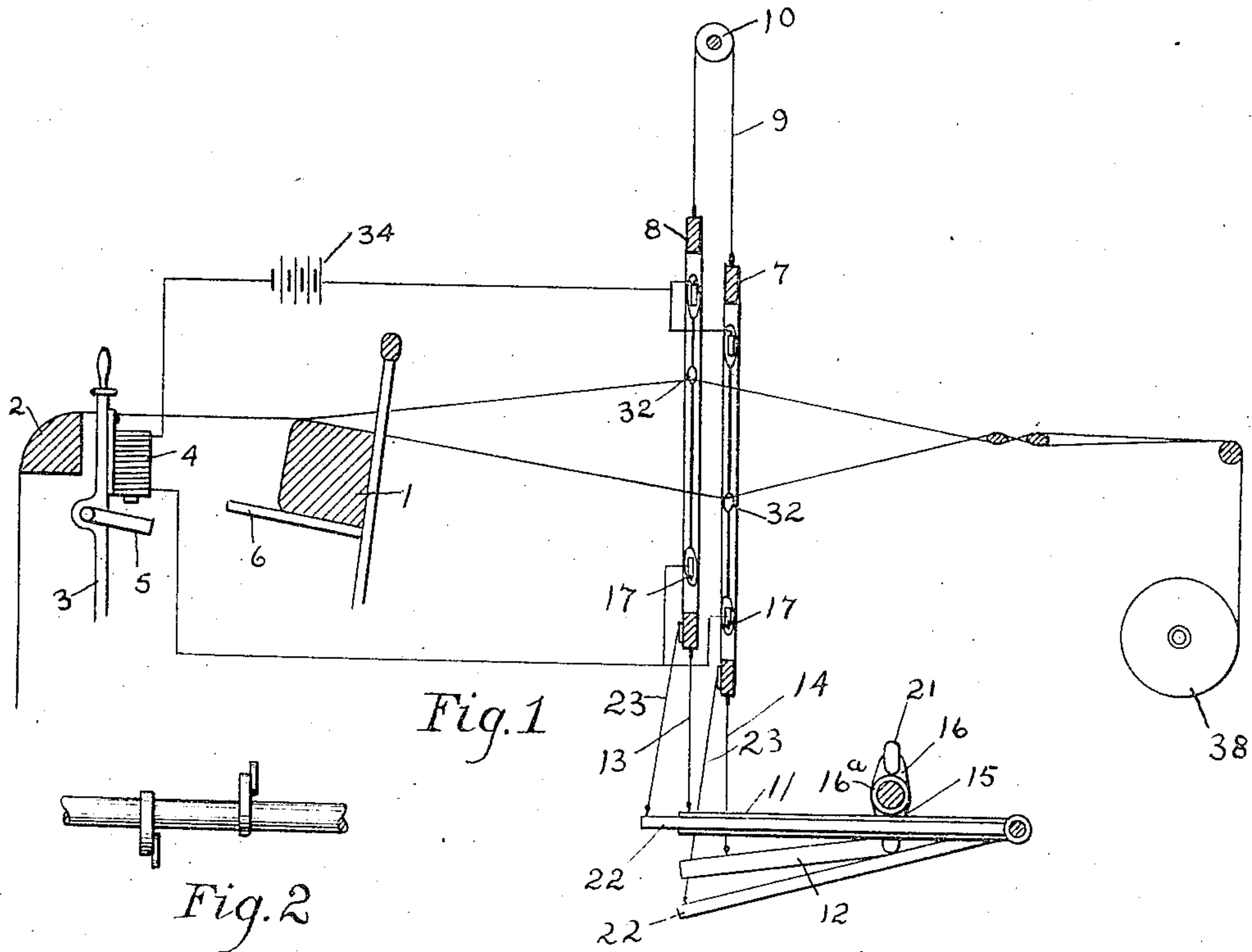


No. 898,357.

PATENTED SEPT. 8, 1908.

W. GROSS.  
WARP THREAD DETECTING DEVICE.

APPLICATION FILED JULY 5, 1907.



Witnesses

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# UNITED STATES PATENT OFFICE.

WILHELM GROSS, OF FALL RIVER, MASSACHUSETTS.

## WARP-THREAD-DETECTING DEVICE.

No. 898,357.

Specification of Letters Patent.

Patented Sept. 8, 1908.

Application filed July 5, 1907. Serial No. 382,157.

*To all whom it may concern:*

Be it known that I, WILHELM GROSS, a subject of Germany, residing at the city of Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Warp-Thread-Detecting Devices, of which the following is a specification, reference being had therein to the accompanying drawing.

10 This invention relates to warp thread detectors and has for its object to provide a simple and effective means for opening the warp, or separating the threads so as to clearly indicate the position of a slack or broken warp end.

15 A further object of the invention is to provide means whereby the loom may also be automatically stopped when the detecting mechanism is operated.

20 By my improved device, the warp is opened or drawn wide apart longitudinally at the point where the thread is broken, thereby plainly showing the exact position of the broken thread which may then be easily repaired without loss of time. My means of accomplishing this object is by using the ordinary heddle wires and suspending the same in the heddle frame on each individual warp thread. A transversely reciprocating bar is arranged to operate through these wires whereby when a thread is broken or becomes unduly slack the wire drops and engages said reciprocating bar, which is provided with teeth or other engaging means, and by the movement of this bar said wire is drawn to one side, widely separating the warp threads at that point to clearly indicate the position of the broken end.

35 The invention is fully set forth in this specification and more particularly pointed out in the appended claims.

40 In the accompanying drawings: Figure 1—is a diagrammatic view representing those portions of the loom which are necessary to the understanding of my invention. Fig. 2—is a detail showing the cam shaft and cams thereon which operate the heddle frames and the reciprocating bars therein. Fig. 3—is a front elevation illustrating the heddle frame and showing one of the heddles as being drawn to one side to open the shed and indicate the position of the broken thread. Fig. 4—shows a cross section of the upper or reciprocating bar in the heddle frame, and also showing the metallic contact blade set therein.

Referring to the drawings at 1 is the usual lay and 2 the breast beam of the loom. The knock-off lever 3 being shown with a magnet 4 located thereon, which when energized draws up the tongue 5 in position to intercept the fingers 6 on the lay whereby said lever will then be knocked off to stop the loom.

7 and 8 indicate two heddle frames which are connected together by means of the strap 9 over the pulley 10 to work in time with each other. The lower end of these frames are connected to the levers 11 and 12 by means of the cords 13 and 14 whereby the same are operated in time with each other and in opposite directions by means of the cams 15 and 16 mounted on cam shaft 16<sup>a</sup>. At the lower side of these heddle frames is mounted the fixed bar 17 which is adapted to pass through the eyes at the lower end of the heddles. At the upper end of this frame is located a reciprocating bar 19 which passes through the upper eye in the heddle and is adapted to slide through the sides of the heddle frame in any convenient manner, said bar being notched at its upper edge at 20. This bar is adapted to be drawn in one direction by the cam 21 through the movement of lever 22 and cord 23 which cord is drawn over the pulleys 24, 25 and 26 and fastened at its opposite end at 27 to said bar 19, said bar being moved in the opposite direction by means of the spring 28. This bar 19 is preferably constructed of insulating material and is provided on its upper edge with a metallic blade 19<sup>a</sup> which is notched at 20. The lower heddle bar 17 is made of non-conducting material and is also provided with a metallic contact blade 17<sup>a</sup> on its lower edge, whereby the heddles are allowed to come in contact with but one of said blades at a time and therefore the circuit cannot be completed until a heddle wire falls and is carried over at a sufficient angle to come in contact with and bridge the metallic edges of both bars. Mounted in these heddle frames are a plurality of heddles 29 which may be of any desired size or shape. At either end of these heddles are elongated eyes 30 and 31 adapted to engage the fixed bar 17 below, and the reciprocating bar 19 above, respectively, and at the center of the heddle is the usual thread eye 32 through which the warp thread passes, the tight threads holding the heddles up in contact with the lower bar, as the frame descends to open the shed.

The reciprocating bar 19 is electrically con-



connected by means of the wire 33 through the battery 34 to the magnet 4 and the fixed bar 17 is also connected to said magnet 4 through the wire 35 so that when a connection is made between the bars 17 and 19 the circuit is completed and the magnet 4 energized to stop the loom.

The operation of the invention may be more fully described as follows: The warp is run in the usual way from the beam 38 and the different threads pass through the eyes 32 of their respective heddles through the reed and over the breast beam in the usual manner. The heddle frames are adapted to reciprocate in time with each other in the usual way to open the shed perpendicularly. Each time a frame descends the tension of the warp threads hold the heddles up against the blade 17<sup>a</sup> on the underside of the lower supporting bars 17 and clear of the blade 19<sup>a</sup>, at the same time this reciprocating bar is drawn through the frame across the threads, and if for any cause one of said threads is broken or becomes sufficiently slack to allow its heddle 36 to drop and come in contact with said movable blade, the upper end of said heddle 36 is drawn over to one side coming in contact with the next adjacent heddle 37 which is being held up against the lower blade, thereby completing a double circuit, one through the heddle 36, which on account of its inclined position comes in contact with both the lower and upper blades, the other contact being through this heddle 36 and the adjacent heddle 37 whereby the circuit is completed to position the frog and knock off the lever to stop the loom. By the drawing of this heddle so far to one side the threads of the warp with which it comes in contact, are open widely so as to clearly indicate the position or point where the broken thread is located.

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

1. A warp thread detecting device for looms comprising heddles adapted to engage the warp threads, and means whereby the heddles are automatically moved to one side to separate the warp threads when one of said threads becomes broken or slack, whereby the position of the broken or slack thread is indicated.

2. A warp thread detecting device for looms comprising a heddle frame, heddles therein, a reciprocating bar adapted to move said heddles to one side to separate the warp threads when one of said threads becomes broken or slack, whereby the position of the broken or slack thread is indicated, and means for actuating said bar.

3. A warp thread detecting device for looms comprising a heddle frame, heddles in said frame and provided with means for engaging the warp threads, said heddles being

suspended by said threads when the frame is down, and a reciprocating bar adapted to move said heddles to one side to separate the warp threads when one of said threads becomes broken or slack, whereby the position of the broken or slack thread is indicated.

4. A warp thread detecting device for looms comprising a heddle frame, heddles in said frame and provided with means for engaging the warp threads, said heddles being suspended by said threads when the frame is down, and a reciprocating bar provided with serrations adapted to engage said heddles and move the same to one side to separate the warp threads when one of said threads becomes broken or slack, whereby the position of the broken or slack thread is indicated.

5. A warp thread detector and stop mechanism comprising heddles through which the warp threads pass, means for automatically moving said heddles to one side to separate the warp threads when one of said threads becomes broken or slack, whereby the position of the broken or slack thread is indicated, and means for stopping the loom when one of said threads becomes broken or slack.

6. A warp thread detector and stop mechanism comprising a heddle frame, heddles in said frame, a reciprocating bar adapted to move said heddles to one side to separate the warp threads when one of said threads becomes broken or slack, whereby the position of the broken or slack thread is indicated, and means operatively connected with said bar for stopping the loom.

7. A warp thread detector and stop mechanism comprising a heddle frame, heddles in said frame and provided with means for engaging the warp threads, said heddles being suspended by said threads when the frame is down, a reciprocating bar adapted to move said heddles to one side to separate the warp threads when one of said threads becomes broken or slack, whereby the position of the broken thread is indicated, and means operatively connected with said bar for stopping the loom.

8. A warp thread detector and stop mechanism comprising heddles adapted to engage the warp threads, means whereby the heddles are automatically moved to one side to separate the warp threads when one of said threads becomes broken or slack, whereby the position of the broken or slack thread is indicated, and means operated by the side movement of said heddles for stopping the loom.

9. A warp stop motion for looms comprising a heddle frame, heddles mounted therein, electric stop mechanism, terminals in said frame in circuit with said mechanism, means for supporting the heddles in such position that they will normally contact with but one of said terminals, and means for



moving said heddles to one side when one of the warp threads becomes broken or slack, whereby the circuit is closed between said terminals by one of said heddles.

- 5 10. A warp stop motion for looms comprising a heddle frame, heddles mounted therein, electric stop mechanism, terminals in said frame in circuit with said mechanism, said heddles being supported so as to nor-  
10 mally contact with but one of said terminals, and a reciprocating bar for moving

said heddles to one side when one of the warp threads becomes broken or slack, whereby the circuit between said terminals is closed by one of said heddles.

In testimony whereof I affix my signature in presence of two witnesses.

WILHELM GROSS.

Witnesses:

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E. I. OGDEN.