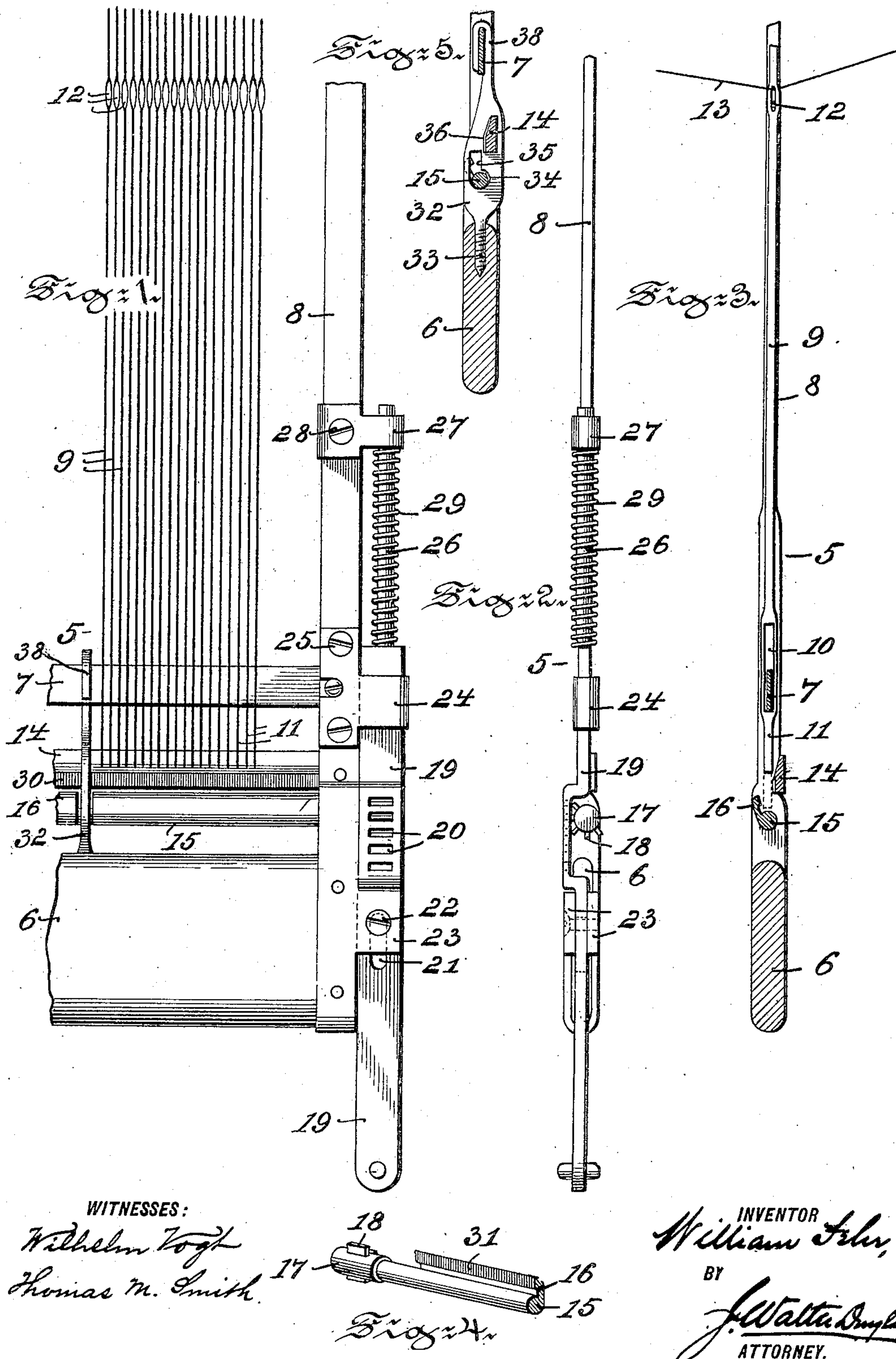


No. 843,882.

PATENTED FEB. 12, 1907.

W. FEHR.
WARP STOP MOTION DETECTOR.

APPLICATION FILED JULY 14, 1906.



UNITED STATES PATENT OFFICE

WILLIAM FEHR, OF PHILADELPHIA, PENNSYLVANIA.

WARP-STOP-MOTION DETECTOR.

No. 843,882.

Specification of Letters Patent.

Patented Feb. 12, 1907.

Application filed July 14, 1906. Serial No. 326,181.

To all whom it may concern:

Be it known that I, WILLIAM FEHR, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Warp-Stop-Motion Detectors, of which the following is a specification.

My invention has relation to a warp-stop-motion detector for looms of the class in which heddles are employed for automatically stopping the loom when one of the warp-threads break or become unduly slack, and in such connection it relates more particularly to the construction and arrangement of the detector.

The principal objects of my invention are, first, to provide a heddle-frame with a detector and with means to rock the same, which may be actuated by any well-known mechanisms employed to stop the loom, when a warp-thread breaks or slackens; second, to so arrange the detector and the means for actuating the same carried by the heddle-frame as not to project beyond the frame proper, and thus to permit of the arrangement of the frames in proximity to each other in a loom, and, third, to provide means to hold certain of the parts of the detector in a rigid operative position in the heddle-frame.

The nature and scope of my present invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a view illustrating in side elevation a portion of a heddle-frame, a detector, and a supporting-bar for the heddles, means for rocking the detector carried by the side straps of the heddle-frame, and means for holding certain of the parts of the detector in a rigid operative position in the frame, embodying main features of my present invention. Fig. 2 is a view illustrating in end elevation the heddle-frame, a sector-gear connected with the detector, and a spring-controlled rack slidably connected with one of the end straps of the frame. Fig. 3 is a vertical sectional view of the heddle-frame, illustrating in side elevation the heddles used in conjunction with the frame. Fig. 4 is a detailed perspective view illustrating the detector removed from the frame; and Fig. 5 is a vertical sectional view of a portion of the frame, illustrating in side elevation a hook or brace for rigidly connecting the cross-bars

with the ends bars of the heddle-frame and of certain of the parts of the detector with the same and with each other.

Referring to the drawings, 5 represents a heddle-frame consisting of the end bars 6 and cross-bars 7, which are connected with each other in the usual well-known manner by side straps 8, a portion of which parts has been shown in Fig. 1. Upon the cross-bar 7 of the frame 5 are arranged heddles 9, consisting in the present instance of narrow flat strips of metal having elongated mortises 10 at each end to permit of certain movements of the heddles on the cross-bars 7. Each of the heddles is also provided with an extension 11, which in the raised position of the heddle 9, through the intervention of a warp-thread 13 passing through the eye 12 thereof, terminates opposite a bar 14, secured to the side straps 8 of the frame 5. Below the bar 14 in the side straps 8 is movably arranged a rod 15, provided with a tongue or rib 16, which when the rod 15 is rocked oscillates back and forth below the extensions 11 of the heddles 9. The rocking movement is imparted to the rod 15 by projections or teeth 18, arranged in an extension 17 thereof, forming a sector-gear, which meshes with a rack formed in the present instance by a bar 19, having slots 20. The bar 19 by means of a bolt 22 passing through a slot 21 thereof is connected at its lower end with projections 23, formed integral with the side straps 8. At the upper end the bar 19 is connected with the side strap 8, preferably by a guide 24, removably secured thereto by bolts 25 and terminating at this end in a rod 26, sliding in a guide 27, removably secured to the side strap 8 by a bolt 28. However, the side strap 8, if desired, may be provided with projections which when bent to surround the bar 18 form the guides 24 and 27.

Upon the rod 26 is arranged a spring 29, which by tending to depress the bar 19 in the guides 24 and 27 and the projections 23 of the side strap 8 holds the rod 15 and its rib 16 in the position shown in Fig. 3. This position, however, is determined by the slot 21 and bolt 22 of the projections 23 passing therethrough. The bar 19 is raised when the heddle-frame is at rest. The rib 16 of the rod 15 is swung from left to right in Fig. 3, which movement is reversed by the spring 29 shifting the bar 19 backward to its normal position, as shown in Figs. 1 and 3. When, however, one of the warp-threads 13 breaks,

the heddle 9, supported by the same, drops into the position shown by dotted lines in Fig. 3, in which position the extension 11 thereof rests between the rib 16 of the rod 15 and the bar 14. The rib 16, which engages the extension from one side thereof, prevents the rod 15 from being turned by the bar 19, and the rod thus locked actuates a mechanism which brings the machine to a standstill in a well-known manner.

In order to prevent the turning of the extensions 11 of the heddle 9 when the same is forced by the rib 16 of the rod 15 against the bar 14 during the actuation of a mechanism not shown, the rib 16 and bar 14 is notched as at 30 and 31, respectively, into which notches the edges of the extension 11 pass, thus holding the same in proper position between the rib 16 and bar 14 by preventing turning or twisting of the extension at this time.

As shown in Fig. 2, the rod 15, the extension 17, and the teeth 18, as well as the slotted bar 19 for rocking the rod 15 and the rib 16, do not extend beyond the end bars 6 of the heddle-frame 5, thus permitting the heddle-frames to occupy a position in proximity to each other in a loom without interfering with the proper actuation of the rod 15 by the bar 19. To render the rod 15 and bar 14 operative, it is necessary to maintain the same in a rigid position parallel to the end bars 6 of the frame 5. This is accomplished by stiffening braces or hooks 32, which are placed a certain distance apart from each other, which distance and number of hooks, however, is determined by the length of the heddle-frame employed. Each of the hooks or braces 32 is provided with a threaded extension 33, which by being screwed into the end bar 6 firmly holds the hook in position thereon. In the body of the hook 32 are arranged a communicating substantially annular slot 34 and a straight slot 35, as well as a partially-tapering slot 36, while the free end of the body terminates in a hook portion 38, which surrounds the cross-bar 7, and thus connects the same rigidly with the end bars 6, as shown in Figs. 1 and 5. The communicating slots 34 and 35 serve to permit of the introduction of the rod 15 and its rib 16 through the hook 32, and the slot 34 by substantially surrounding the rod 15 permits the hook to rigidly hold the same in a fixed position parallel to the end bar 6 and at the same time is afforded by the hook a rocking movement of said rod. The bar 14 is also held in a fixed position in passing through the slot 36 of the hook 32 parallel to the rod 15 and the end bar 6 and cross-bar 7, which bars 6, 7, and 14 and rod 15 are thus rigidly connected and held in proper position with respect to each other. When the rib 16 of the rod 15 of the detector strikes against the extension 11 of a dropped heddle 9 and

forces the same against the bar 14, a bending of the bar and rod laterally beyond the plane of the sides of the side straps 8 is effectually prevented by the rigid connection of the rod 15 and bar 14 with each other and with the end bars 6 and cross-bars 7. Such a bending of the rod 15 and bar 14 would render the above-described detector inoperative.

Having thus described the nature and objects of my invention, what I claim, and desire to secure by Letters Patent, is —

1. The combination, with a heddle-frame having heddles movably arranged therein, of a warp-stop-motion detector, consisting of a rod mounted in the frame, a rib projecting from said rod, a bar carried by said frame, means slidably connected with said frame and adapted to rock said rod and oscillate the rib thereof, except when one of the heddles descends between the rib and bar, and means carried by said sliding means adapted to depress the same in said frame so as to hold the rib of said rod in a normally inoperative position.

2. The combination, with a heddle-frame having heddles movably arranged therein, of a warp-stop-motion detector, consisting of a rod mounted in the frame, a rib projecting from said rod, a bar carried by said frame, means slidably connected with said frame and adapted to rock said rod and oscillate the rib thereof, except when one of the heddles descends between the rib and bar, and means for connecting said rod and bar with each other and said frame, and for preventing yielding of the same when said rib engages a descended heddle.

3. The combination with a heddle-frame having side straps and heddles movably arranged therein, of a warp-stop-motion detector, consisting of a rod mounted in the side straps, a rib projecting from the rod, a bar carried by the straps and held by the same above said rod and rib thereof, a gear connected with said rod, and a bar having slots slidably connected with one of the side straps engaged by the teeth of said gear and said slotted and said first bar, gear-wheel, rod and rib of said rod arranged so as to not extend laterally beyond said frame.

4. The combination with a heddle-frame having side straps and heddles movably arranged therein, of a warp-stop-motion detector, consisting of a rod mounted in the side straps, a rib projecting from the rod, a bar carried by the straps and held by the same above said rod and rib thereof, teeth carried by said rod, a bar having slots slidably connected with one of the side straps engaged by the teeth of said rod, said slotted bar, when shifted, adapted to rock said rod and oscillate the rib thereof by the teeth, except when one of the heddles descends between said rib and first bar, means carried by said slotted bar adapted to normally depress

the same in said frame, and a brace or hook for connecting said rod and first bar with each other and with said heddle-frame.

5 5. In combination, a heddle-frame having side straps and a cross-bar, a series of heddles having elongated mortises arranged on the cross-bar, each heddle being vertically movable independently of the others and having an eye for a warp-thread, and a warp-stop-motion detector, consisting of a rod mounted
10 in said side straps, a rib projecting from said rod, a bar carried by the straps and held by the same above the rod and rib thereof, a gear connected with the rod, a bar having
15 slots slidably connected with one of the side straps, a spring for depressing the slotted bar in the supporting-strap thereof and by the same and gear holding the rod and rib thereof, in a position to permit of descent of a heddle between the rib and said first-mentioned
20 bar, and said slotted bar adapted, when raised, to rock the rod and oscillate the rib thereof, except when one of the heddles is dropped in the frame.

25 6. In combination, a heddle-frame having an end bar, side straps and a cross-bar, a series of heddles having elongated mortises arranged on the cross-bar, each heddle being

vertically movable independently of the others and having an eye for a warp-thread, and
30 a warp-stop-motion detector, consisting of a rod mounted in said side straps, a rib projecting from said rod, a bar carried by the straps and held by the same above the rod and rib thereof, a gear connected with the
35 rod, a bar having slots slidably connected with one of the side straps, a spring for depressing the slotted bar in the supporting-strap thereof and by the same and gear holding the rod and rib thereof, in a position to
40 permit of descent of a heddle between the rib and said first-mentioned bar, said slotted bar adapted, when raised, to rock the rod and oscillate the rib thereof, except when one of the heddles is dropped in the frame, and a
45 hook connecting the rod and first-mentioned bar with the end bar and cross-bar and for holding the same in a fixed and parallel position with respect to each other.

In testimony whereof I have hereunto set
50 my signature in the presence of two subscribing witnesses.

WILLIAM FEHR.

Witnesses:

J. WALTER DOUGLASS,
THOMAS M. SMITH.