No. 646,812. Patented Apr. 3, 1900.

J. F. DUSTIN.

WARP STOP MOTION FOR LOOMS.

(No Model.) (Application filed July 29, 1897.)

2 Sheets—Sheet 1.

Fig. 1.

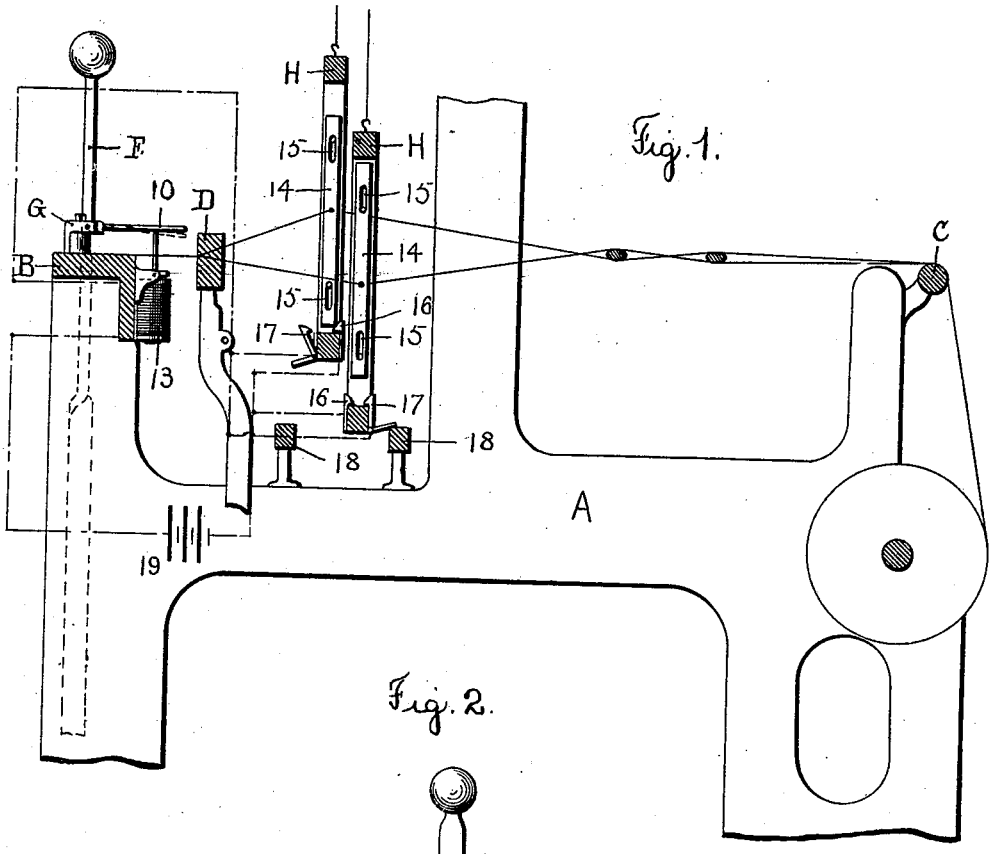


Fig. 2.

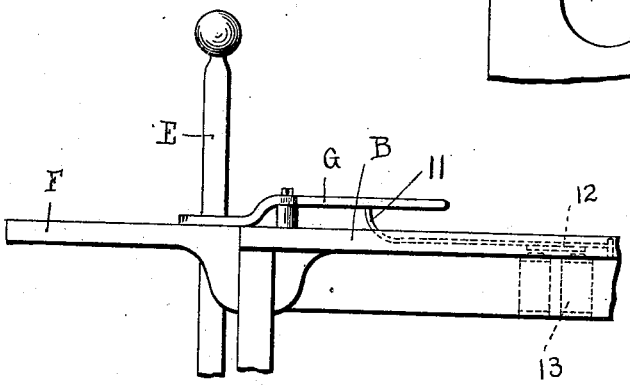
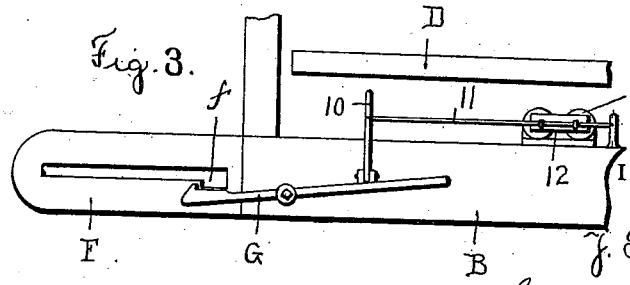


Fig. 3.



Witnesses.

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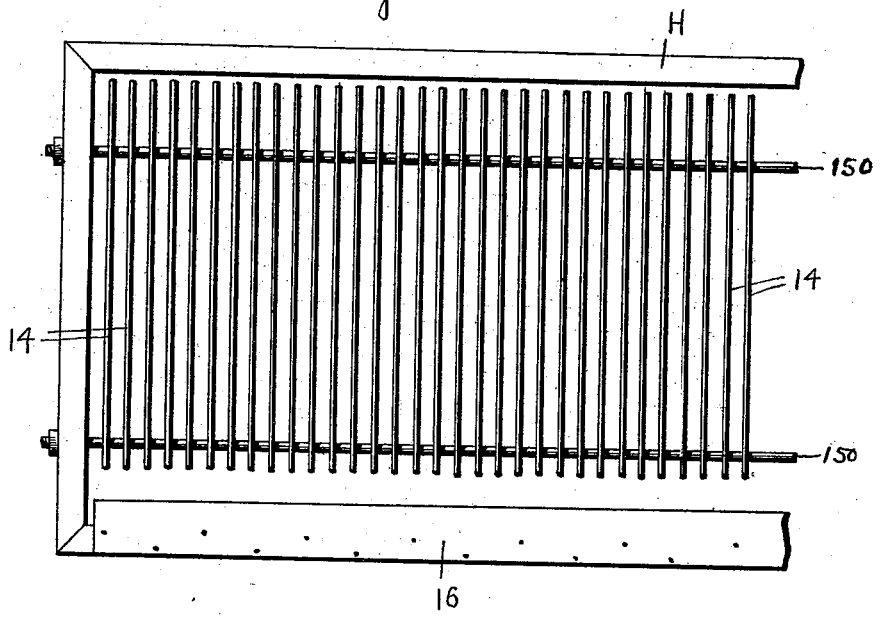
Fig. 4.



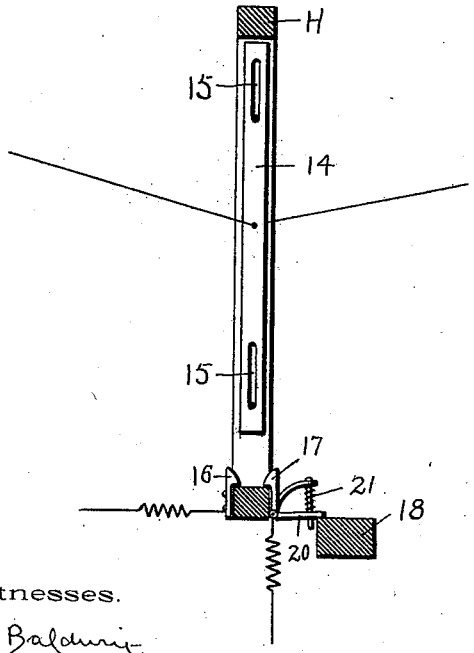


Fig. 5.

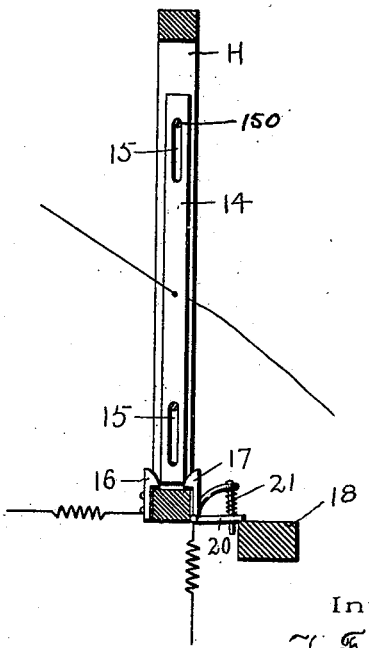


Fig. 6.

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UNITED STATES PATENT OFFICE.

JOHN F. DUSTIN, OF FITCHBURG, MASSACHUSETTS, ASSIGNOR TO HIMSELF AND THE PARKHILL MANUFACTURING COMPANY, OF SAME PLACE.

WARP STOP-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 646,812, dated April 3, 1900.

Application filed July 29, 1897. Serial No. 646,328. (No model.)

To all whom it may concern:

Be it known that I, JOHN F. DUSTIN, a citizen of the United States, residing at Fitchburg, in the county of Worcester and State of Massachusetts, have invented a new and useful Improvement in Warp Stop-Motions for Looms, of which the following is a specification.

My invention relates to a construction for automatically stopping a loom whenever a warp-thread is broken, and the especial object of my invention is to provide a simple and efficient warp stop-motion which can be readily and cheaply applied to the existing forms of looms.

To these ends my invention consists of the parts and combinations of parts hereinafter described, and more particularly pointed out in the claims at the end of this specification.

In the accompanying two sheets of drawings, Figure 1 is a sectional view illustrating sufficient parts of a loom to show the application of my invention thereto. Fig. 2 is a partial front view of the left-hand end of a loom, showing the usual shipper-handle and the knock-off lever coöperating therewith. Fig. 3 is a plan view of the devices which coöperate with the shipper-handle. Fig. 4 is a partial front view of a heddle-frame constructed according to my invention. Fig. 5 is a sectional view of the same, and Fig. 6 is a similar view showing the parts in a different relative position.

An electric warp stop-motion constructed according to my invention comprises a series of movably-mounted metallic heddles supported in a heddle-frame in position to coöperate with contact-strips carried by the heddle-frame, one of said contact-strips having a reciprocating movement to clamp or squeeze the end of a heddle tightly between the contact-strips whenever such a heddle is allowed to drop down or assume an abnormal position by reason of the breaking of its warp-thread.

In applying my warp stop-motion to an ordinary loom I preferably combine the ordinary knock-off lever forming part of the usual warp stop-motion with an electrically-controlled arm or projection which is moved into the path of the lay to automatically actuate the knock-off lever when an electric circuit is completed by the dropping down of one of the metallic heddles.

Referring to the drawings and in detail, A designates the side frame of a loom; B, the breast-beam thereof; C, the whip-roll; D, the vibrating lay; E, the shipper-handle, which is mounted in a bracket F in position to be held in a notch *f* when the loom is in operation; G, the knock-off lever, and H the vertically-movable harness-frames. These parts may be of the ordinary or approved construction and need not be herein described at length.

Extending from the knock-off lever G is an arm or rod 10, which normally occupies a position above the path of the vibrating lay. A rod 11 is connected to the pivoted arm 10 and is secured to an armature 12 of the electric magnets 13, mounted on the breast-beam B. By means of this construction when the electric magnets 13 are energized the pivoted arm 10 will be drawn down into the path of the vibrating lay D, so that the knock-off lever G will be operated thereby to release the shipper-handle from its notch *f*, allowing the shipper-handle to spring back to stop the loom in the ordinary manner.

As shown most clearly in Fig. 2, the rod or wire 11 is located somewhat below the level of the top of the breast-beam B, so as not to interfere with the ordinary weft stop-motion, which may be arranged to coöperate with the knock-off lever G.

Mounted in the heddle-frames H are metallic heddles 14, which are provided with eyes near their centers for receiving the warp-threads and with slots 15 near their ends for receiving the heddle-rods 150. The heddles 14 are preferably formed of flat steel wires, and as thus mounted they act as drop-heddles—that is to say, the heddles have a vertical play or motion in the heddle-frames as said heddle-frames are moved up and down. As a heddle-frame moves down the tension of the warp-threads will raise the heddles to their highest positions in the heddle-frames, as illustrated in Fig. 5; but if a warp-thread is broken its heddle will be left free to fall down to the position illustrated in Fig. 6, between the contact-strips.

The contact-strips mounted on the heddle-

frame preferably comprise a stationary strip 16 and a pivoted or movable feeler or contact-strip 17. The movable contact-strip or feeler 17 preferably has a yielding or spring connection for actuating the same, although a rigid feeler may be employed when the parts are properly adjusted, as illustrated in Fig. 1. As shown in Figs. 5 and 6, to provide a yielding connection for the feeler I may employ a pivoted arm 20 for engaging a stop 18, with a spring 21 connected to actuate the feeler 17 from the arm 20. By means of this construction if a heddle 14 is allowed to drop down between the contact-pieces 16 and 17 as the heddle-frame descends the movable contact-piece 17 will be turned or moved in to clamp or squeeze the end of the heddle between itself and the fixed contact-piece, and by arranging the parts in this manner, so that a considerable pressure will be exerted upon the end of the heddle, I am enabled to secure positive and certain electrical connections which will stop the loom, as hereinafter explained, even when the batteries employed are somewhat weak—that is to say, when an electric circuit is completed through the magnets 13 the pivoted arm 10 will be drawn down into the path of the vibrating lay, so that as the lay comes forward the knock-off lever will be operated and the loom automatically stopped.

I am aware that it has been proposed to employ movably-mounted heddles for closing electrical connections for operating the stopping devices of a loom, and I do not herein claim such a construction broadly, my form of warp stop-motion being an improvement upon former constructions, principally from the fact that by clamping a heddle between two contact-strips, one of which is movable, I am enabled to secure reliable electrical connections.

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

1. In an electric warp stop-motion for looms, the combination of the loom-stopping devices, a heddle-frame, metallic heddles movably mounted therein, and two contact-strips mounted in and movable with the heddle-frame in position to coöperate with said heddles, one of said contact-strips being reciprocated or moved to close an electric circuit by clamping a heddle between said contact-strips on the breaking of a warp-thread, substantially as described.

2. In a warp stop-motion for looms, the combination with the stopping devices, a heddle-frame H, metallic heddles 14 mounted therein and having central eyes for receiving the warp-threads, and end slots 15 for engaging the heddle-rods, contact devices comprising a contact-strip 16, a movable contact-strip or feeler 17, said strips being arranged below the heddles 14, so that the tension of the warp-threads will normally hold the heddles up out of engagement therewith when the heddle-frame moves down, a stop 18 for moving in the contact-strip or feeler 17, and electric connections for controlling the stopping devices, substantially as described.

3. In a warp stop-motion for looms, the combination of the shipper-handle E, the knock-off lever G, the pivoted arm 10, the vibrating lay D, the electric magnets 13 connected to move the pivoted arm into the path of the lay, a harness-frame H, metallic heddles 14 movably mounted in the harness-frame, contact devices comprising a contact-strip 16 and a movable contact-strip or feeler 17 arranged below the heddles 14 so that the tension of the warp-threads will normally hold the heddles up out of engagement therewith when the heddle-frame moves down, and a stop 18 for moving in the contact-strip or feeler 17 to complete an electric circuit, and stop the loom on the breaking of a warp-thread, substantially as described.

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

JOHN F. DUSTIN.

Witnesses:
RALPH E. THOMSON,
HARRY G. TOWNEND.