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PATENTED NOV. 12, 1907.

E. A. THISSELL.

WARP STOP MOTION.

APPLICATION FILED JAN. 31, 1907.

3 SHEETS--SHEET 2.

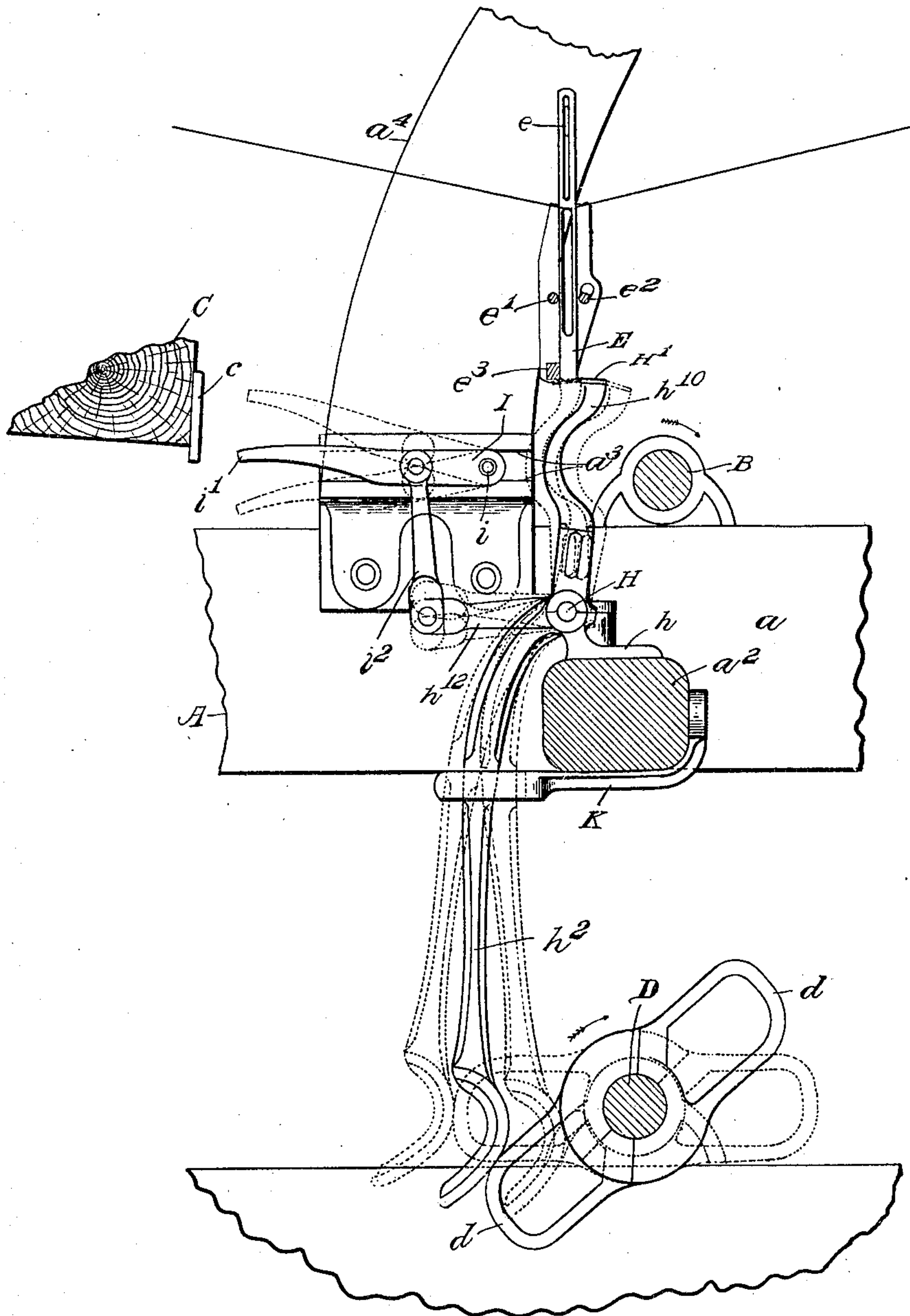


Fig. 3.

WITNESSES:

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Grace Crowley.

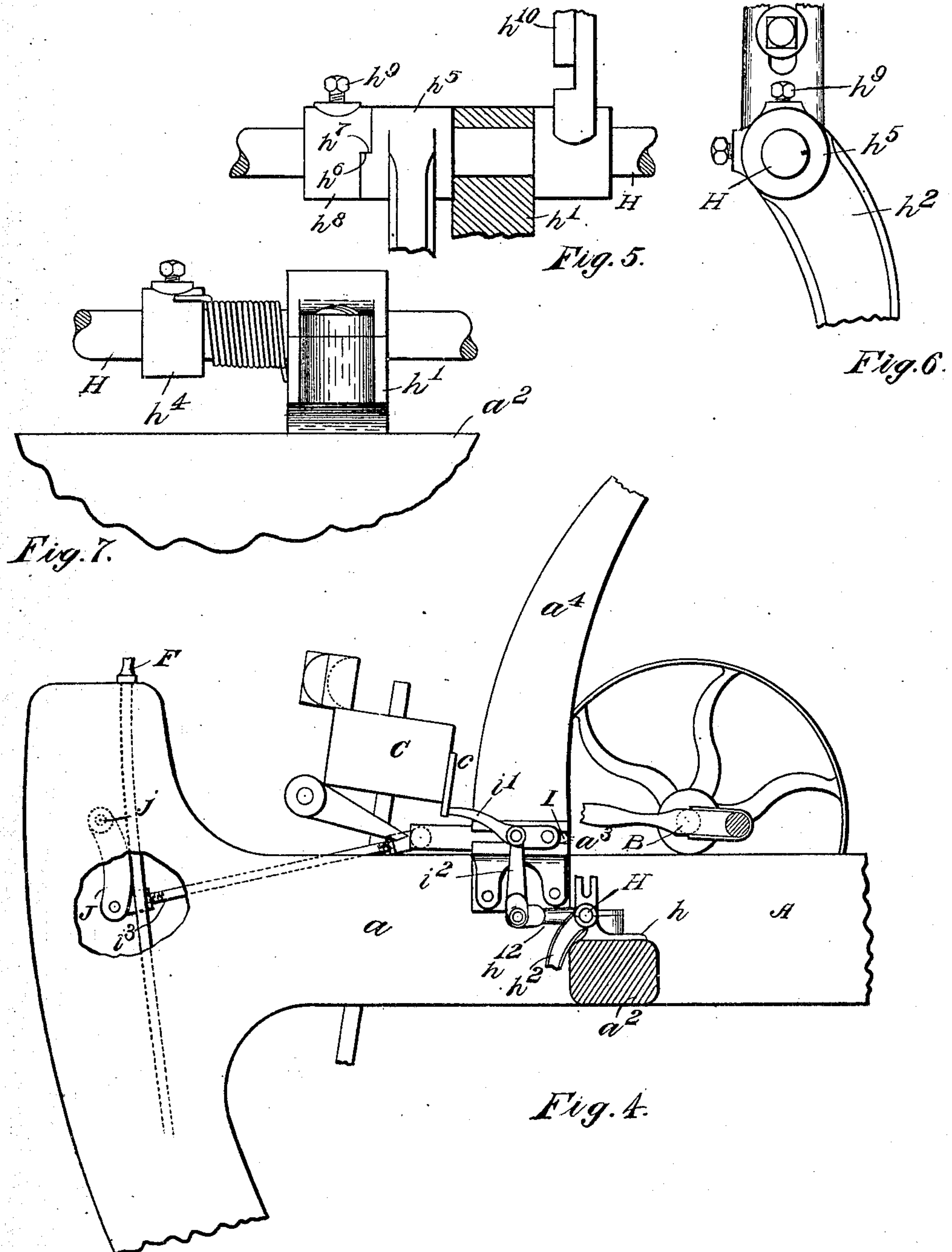
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Clarence E. Lesner.

Inventor:
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UNITED STATES PATENT OFFICE.

EARL A. THISSELL, OF LOWELL, MASSACHUSETTS.

WARP STOP-MOTION.

No. 871,048.

Specification of Letters Patent.

Patented Nov. 12, 1907.

Application filed January 31, 1907. Serial No. 355,045.

To all whom it may concern:

Be it known that I, EARL A. THISSELL, a citizen of the United States, residing at Lowell, in the county of Middlesex and Commonwealth of Massachusetts, have invented a certain new and useful Improvement in Warp Stop-Motions, of which the following is a specification.

This invention relates to warp-stop motions.

In this invention a vibrator consisting of a horizontal bar parallel with the lay-beam has a laterally reciprocating movement, being positively moved backward by the action of a cam on the cam-shaft and connecting mechanism and forward by a non-positive motion, as by the resilience of a spring, so that when a drop-wire or drop-heddle suspended by a warp-thread falls in the path of the vibrator moving in the last named direction, the vibrator is stopped. The positive movement of the vibrator raises a finger pivoted on a movable piece, into the path taken by the lay during the backward stroke of said lay and said finger is normally drawn downward out of the path of the lay by the forward movement of the vibrator but when a warp-yarn is broken, allowing a drop-wire or heddle to fall in the front of the vibrator and stopping the movement of the vibrator towards the lay, the lay will strike said finger and force back said movable piece and through connecting mechanism will force the shipper out of the notch in the holding-plate, whereupon the shipper will be moved by automatic means in the usual manner to shut off the power. With this stop-motion the loom stops on the backward swing of the lay causing less shock than when the loom is beating up. The spring is very weak and the vibrator will be stopped whether the drop is presented flatwise or edgewise to the vibrator without injury to the drop, so that no special devices are necessary to prevent the drop from turning on its axis.

In the accompanying drawing on three sheets, Figure 1, is a front elevation of the shipper and its holding-plate and the parts of the warp-stop motion, the lay being omitted and the frame being in vertical cross-section; Fig. 2, a plan of the notched holding-plate and a horizontal section of the shipper in the notch; Fig. 3, a vertical section on the line 3 3 in Fig. 1 of the lay, crank-shaft, cam-shaft and center-girth showing in right side elevation a drop-wire, the vibrator, the slide and finger of the vibrator and parts of the loom-frame; Fig. 4, a right side elevation of a part of the left hand loom side, the shipper arranged at the left of the loom, the lay, part of the vibrator, the slide and finger, connections between the slide and shipper and connections between the finger and vibrator-shaft; Fig. 5, a front elevation of parts of the vibrator and of its shaft; Fig. 6, a left side elevation of parts of the vibrator, showing means of adjusting the same; Fig. 7, a rear elevation of

part of a vibrator supporting stand, part of the vibrator-shaft and the spring which moves said shaft.

A indicates the frame; a a^1 , the loom-sides or ends; a^2 , the center-girth; B, the crank-shaft; C, the lay; D, the cam-shaft; E, drop-wires; e , their guide and stop-bar; F, the shipper; f , the spring, which throws the shipper when out of the notch to shut off the power; G, the holding-plate provided with a slot g and notch g^1 ; these parts being of the usual construction and operation.

The cross-bar e does not normally support the drop-wires, which are held up by the unbroken warp-threads, but merely assists in guiding said wires vertically and limits their downward movement when said yarns are broken. Said drop-wires are also guided vertically by two other bars e^1 e^2 arranged in front of and behind said wires as shown in Fig. 3.

Below the drop-wires is arranged the vibrator shaft H which rocks in suitable bearing stands h h^1 , supported on the cross-girth a^2 , being moved positively in one direction by a cam d fast on the cam-shaft D, striking a pend-ent arm h^2 on said vibrator-shaft, the lower end of said arm h^2 being in front of said cam. The arm h^2 is loose on the shaft H but its hub h^5 is provided with a shoulder h^6 which engages a similar shoulder or lateral projection h^7 on a collar h^8 which is secured on said shaft by a set-screw h^9 . A spring, represented as a helical spring h^3 , surrounding said rock-shaft H and having one end engaged by the stand h^1 and the other by a collar h^4 , returns said shaft H to its normal position after the cam d passes said arm h^2 .

Evidently when the arm h^2 swings forward the shaft will be rocked but if the shaft is prevented from returning, said arm may return to its normal position. A blade H^1 is rigidly connected to the shaft H above the same and parallel therewith by radial arms h^{10} h^{11} and normally passes under a thrust-bar e^3 when the rock-shaft is restored to position by the action of the spring h^3 . When a drop-wire E falls in the path of the blade H^1 , said rock-shaft is prevented from returning to normal position.

A slide I is movable in suitable ways a^3 on the arch a^4 or part of the loom-frame and on this slide is pivoted a finger i^1 at its rear end i . The finger i^1 is connected by a link i^2 to an arm h^{12} which extends in front of the shaft H and is rigidly secured thereto. When the arm h^2 swings forward and rocks the shaft H, the finger i^1 is raised into the path of the lay C, but if the rock-shaft is not prevented from turning to its normal position by a fallen drop-wire, the finger is drawn down out of the path of the lay on the backward stroke of the latter. The slide I is connected by a link i^3 to one end of a lever J (Fig. 4) pivoted at its other end, at j , on the loom-side in such a manner that when the finger i^1 remains in the path of the lay and is struck by the lay, said slide will be moved backward and will draw the lever J back-

ward, pulling the shipper out of the notch g^1 in the holding plate and causing the power to be shut off, said lever J having a stud j^1 which reaches in front of said shipper when the latter is in the notch of the holding plate. The back of the stud j^1 is inclined forward so that when the shipper is moved to the notch g^1 of the holding-plate, it passes behind said stud and restores the lever J to normal position. The lay is preferably provided with a plate c to receive the thrust of the finger i^1 .

I claim as my invention:—

1. In a loom, the combination of a shipper, a lay, a cam shaft, a cam secured on said shaft, a vibrator actuated positively in one direction by said cam, yielding means for operating said vibrator in the other direction, a slide, a finger pivoted thereon and raised by the positive movement of said vibrator into the path of said lay and normally withdrawn by the non-positive movement of said vibrator, a lever engaging said shipper, a link directly connecting said slide and said lever, and a drop normally supported by an unbroken warp-thread and arranged and adapted to fall in the path of and to arrest the non-positive movement of said vibrator when said warp-thread is broken.

2. In a loom, the combination of a shipper, a lay, a drop normally supported by an unbroken warp-thread, a cam shaft, a cam secured on said shaft, a vibrator actuated positively in a backward direction by said cam and in a forward direction by a spring and adapted and arranged to be stopped in its forward movement by a fallen drop, a slide, a finger pivoted on said slide and raised by the positive movement of said vibrator into the path of said lay and withdrawn from said path by the forward movement of said vibrator, a lever engaging said shipper and a link directly connecting said slide and said lever.

3. In a loom, the combination of a vibrator-shaft having arms rigidly secured thereto, a vibrator-blade secured to said arms, suitable bearings for said shaft, a spiral

spring surrounding said shaft and connecting one of said bearings to said shaft, to rock said shaft in one direction, another arm carried by said shaft, a cam shaft, a cam carried by said last-named shaft and bearing against said last-named arm, to rock said vibrator-shaft in the other direction, a drop normally supported by an unbroken warp-thread and adapted to fall in the path of said vibrator-blade when said warp-thread is broken and to arrest the movement of said vibrator-shaft due to said spring; a slide, a finger pivoted on said slide and raised by the cam-actuated movement of said vibrator-shaft and lowered by the spring-actuated movement of said vibrator-shaft, a lay adapted in its backward movement to strike said raised finger and to move said slide, a shipper, a lever engaging said shipper and a link directly connecting said slide and said lever.

4. In a loom, the combination of a shipper, a lay, a drop normally supported by an unbroken warp-thread, a cam shaft, a cam secured on said shaft, a vibrator having a rock-shaft, suitable bearings for said rock-shaft, a spiral spring surrounding said rock-shaft and connecting one of said bearings to said rock-shaft, to rock said rock-shaft in one direction, a pendent arm loose on said rock-shaft and provided with a clutch counterpart, another clutch counterpart fast on said rock-shaft and engaging said first-named counterpart when said cam strikes said pendent arm, to rock said rock-shaft in the other direction, a slide, a finger pivoted on said slide and raised by the cam actuated movement of said rock-shaft and lowered by the spring-actuated movement of said rock-shaft and struck by the lay when the last-named movement of said rock-shaft is arrested by the fall of said drop, a lever engaging said shipper and a link directly connecting said slide and said lever.

In witness whereof, I have affixed my signature, in presence of two witnesses.

EARL A. THISSELL.

Witnesses:

ALBERT M. MOORE,
WILLIAM C. DUNNE.