H. W. WILLIAMS.

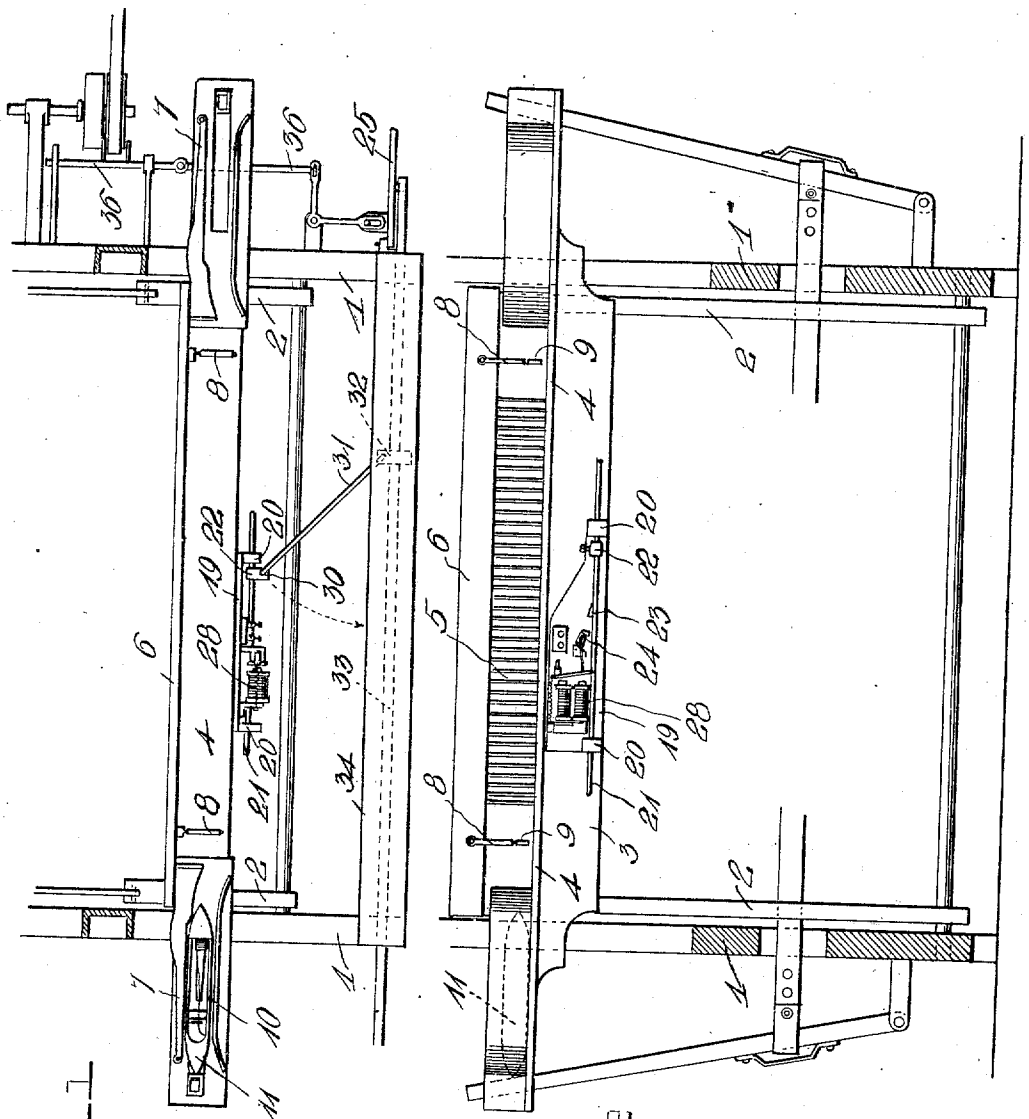
STOP MOTION FOR LOOMS.

APPLICATION FILED JULY 12, 1909.

955,030.

Patented Apr. 12, 1910.

3 SHEETS—SHEET 1.



Witnesses

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3 SHEETS—SHEET 2.

FIG. 4

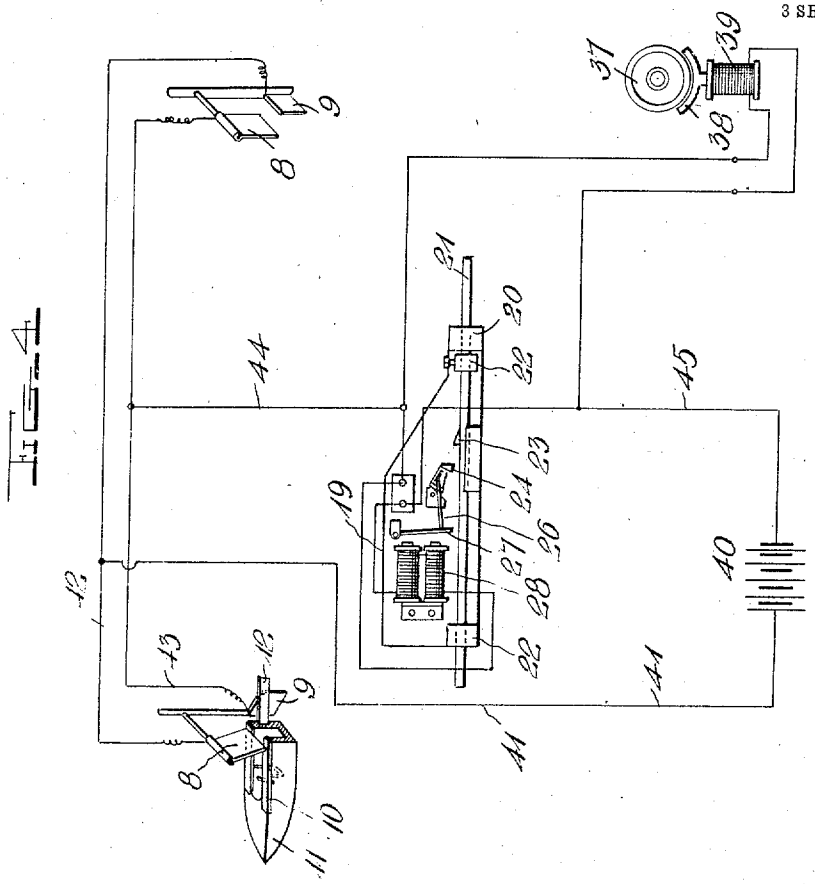
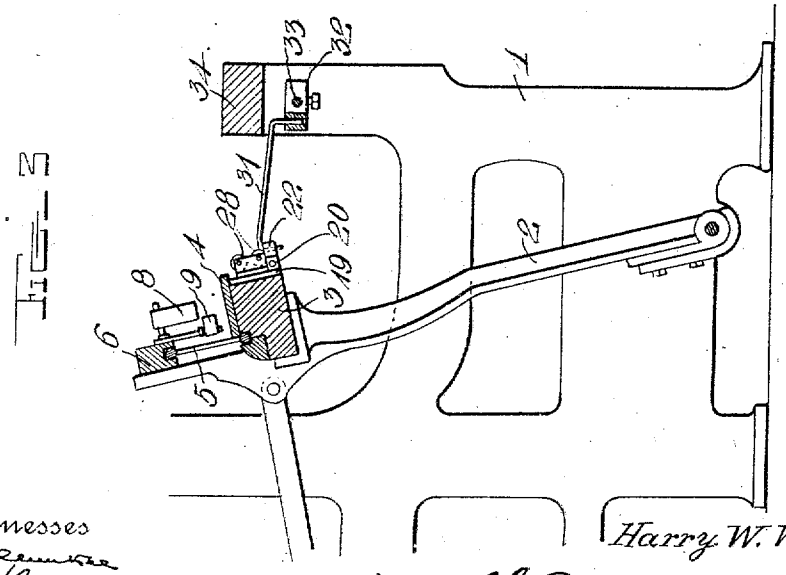


FIG. 5



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3 SHEETS—SHEET 3.

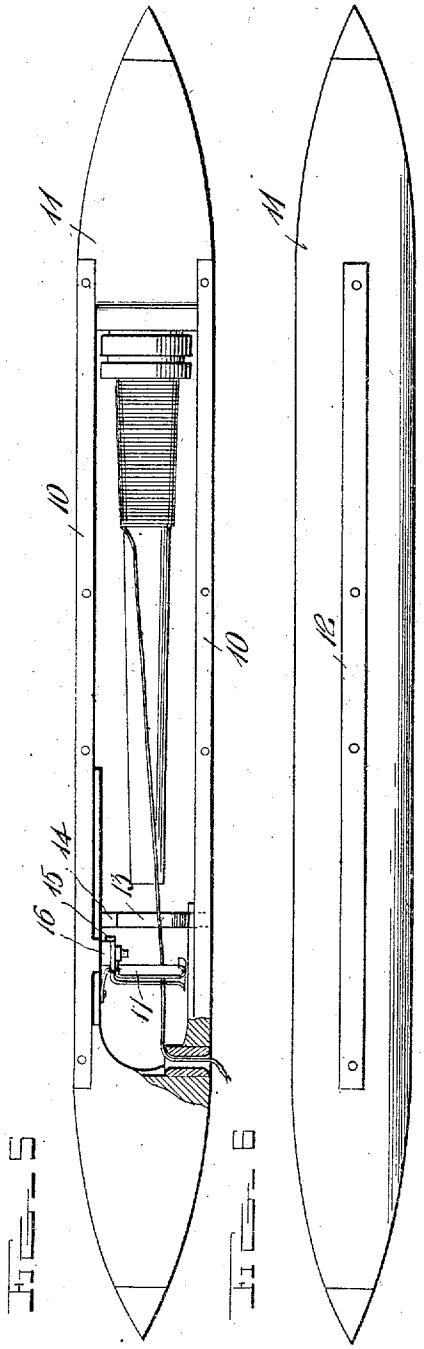

FIG. 5

FIG. 6

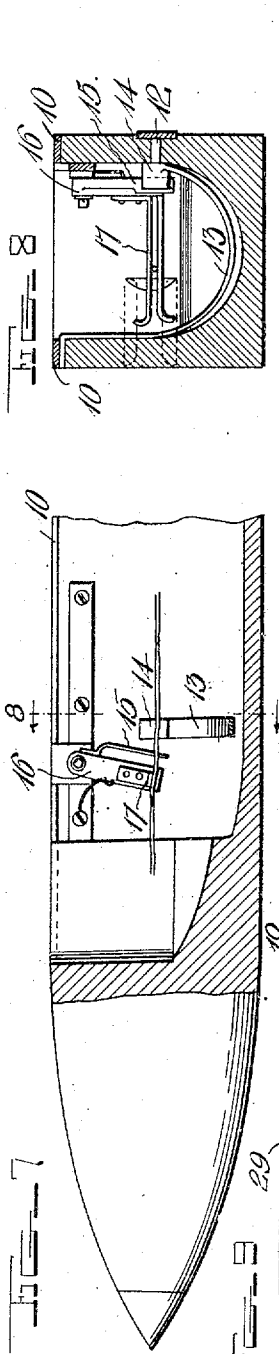

FIG. 7

FIG. 8

FIG. 9

FIG. 10

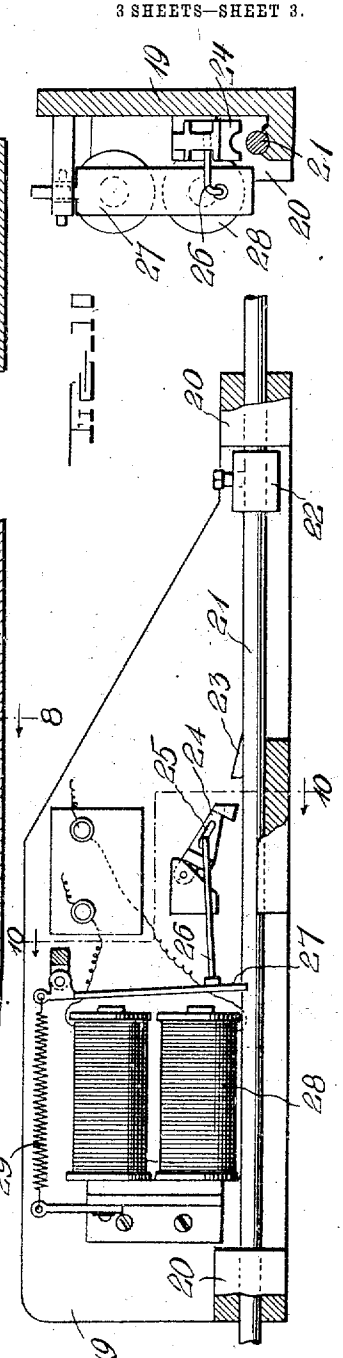

FIG. 11

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UNITED STATES PATENT OFFICE.

HARRY W. WILLIAMS, OF DANVILLE, ILLINOIS, ASSIGNOR OF ONE-HALF TO JOHN WEBSTER, OF DANVILLE, ILLINOIS.

STOP-MOTION FOR LOOMS.

955,030. Specification of Letters Patent. Patented Apr. 12, 1910.

Application filed July 12, 1909. Serial No. 507,145.

To all whom it may concern:

Be it known that I, HARRY W. WILLIAMS, a citizen of the United States, residing at Danville, in the county of Vermilion and State of Illinois, have invented certain new and useful Improvements in Stop-Motions for Looms; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to looms and particularly to stop motions therefor.

Heretofore stop motions have been controlled by feelers so called in the art. This type of device was operated in any suitable manner to feel the weft thread upon the lay. If the weft thread was not present, then the feeler traveled its full length of stroke through any mechanism which acted to stop the loom. Frequently with broken threads, the feeler did not operate, because the thread was too tight to permit the feeler to pass into its receiving aperture.

It is the object of this invention to avoid such difficulties and broadly speaking consists in controlling a stop motion electrically by the condition of the thread as it leaves the shuttle.

With these and other objects in view, the invention consists of certain novel features of construction, combination and arrangement of parts as will be more fully described and particularly pointed out in the appended claims.

In the drawings, Figure 1, is a top plan view of a portion of the loom showing my invention applied thereto. Fig. 2, is a front elevation with parts broken away. Fig. 3, is a side elevation with parts broken away. Fig. 4, is a diagrammatic view of the circuits employed with my attachment. Fig. 5, is a top plan view of the shuttle employed. Fig. 6, is a side elevation of the shuttle. Fig. 7, is a detail longitudinal section. Fig. 8, is a detail cross-section of the shuttle. Fig. 9, is a detail elevation of the tripping mechanism removed from the lay. Fig. 10, is a sectional view on the line 10—10 of Fig. 9; and, Fig. 11 is a detail perspective view of the dog employed.

Referring more especially to the drawings, 1 represents the frame of a loom to which is pivoted the lay swords 2, carrying as is usual the lay 3, with its accompanying race plate 4, reed 5, and reed cap 6. At the extreme ends of the lay, there is mounted the usual shuttle boxes 7, and immediately preceding these upon the frame, are brushes 8 and 9, the former adapted to engage a contact 10 arranged upon the top of the shuttle 11, and the latter adapted to engage a contact strip 12, embedded in the side of the shuttle.

The contact 12, is connected to a bowed stationary member 13, which is arranged inside of the shuttle and provided with a contact point 14, which is adapted to be engaged by a swinging contact finger 15, pivoted to a bracket 16, arranged on the inside of the shuttle and connected to the contact 10. The contact 15, has a tension device 17, mounted thereon through which the thread from the shuttle spindle is adapted to pass to its outlet eye. This tension device, when the thread is under tension, maintains the spring contact arm 18 of the pivoted arm 15, out of contact with the point 14, and prevents the completion of an electric circuit at this point.

Mounted upon the front of the lay is a frame 19, having laterally projecting bearings 20, in which there is adapted to reciprocate a rod 21, upon which there is adjustably mounted a coupling head 22. Intermediate the length of the rod is a cam lug 23, which is adapted to be engaged by a pawl 24, pivoted upon the frame 19, and provided with a longitudinal slot 25, adapted to be engaged by a retracting link 26. This retracting link is connected to the armature 27, of an electromagnet 28, and is held in forward position so as to raise the pawl 24, by a spiral spring 29.

The coupling head 22, is provided with an aperture 30, adapted to receive the connecting link 31, which has its other end pivotally secured in an aperture on an adjustable coupling head 32, carried by the shifter rod 33, which is journaled in suitable bearings beneath the breast beam 34. The shifter rod 33, is pivoted as usual to the shifter levers 35, and these in turn are connected to the belt shifter 36.

Keyed to the driving shaft of the loom is a split pulley 37, which is adapted to be engaged by a magnetically operated brake 38, controlled by the magnet 39, which is in circuit with the battery 40. The brushes 8 and 9 are also connected to the battery through the magnet 28 so that when the switch in the

shuttle is operated to make connection between the contacts 10 and 11, the circuit of the magnet is completed over the following path: battery 40, conductor 41, conductor 42, brush 8, contact 12, through the switch in the shuttle to the contact 10, conductor 43, conductor 44, magnet 28, and back to battery over the wire 45. At the opposite end, the circuit may be followed out in a similar manner.

The magnet 39, is included in a shunt around the magnet 28, and is operated by a portion of the current from the battery 40, when the switch in the shuttle closes the circuit in the brushes at their end of the loom.

It will readily be seen that when a thread is broken in a shuttle, the arm 15, will not long remain away from the contact point 14, but will be forced into engagement therewith and thus make electrical connection between the contacts 10 and 11. This completes the circuit to the magnet 28, which being energized, attracts its armature and pulls the pawl 24, into engagement with the rod 21. Under normal conditions, this rod is reciprocated by reason of the fact that the link 31, has the end which engages the coupling head 22, traveling in the arc of a circle and whose center is defined by its connection with the coupling head 32, upon the shifter rod 33.

As the lay moves forward, the rod 21, moves toward the left and as the lay recedes, the rod moves toward the right. When this rod is stopped in its reciprocation by the pawl engaging the lug 23, the link 31 shoves the shifter rod to one side and operates the shifter lever 35, to throw the driving belt upon a loose pulley.

When the shuttle contacts with the brushes on either end, the shed is opened and the lay is intermediate its forward or rearward position so that all the operator has to do, is to throw the shuttle to the opposite side of the loom and start the same again. When the shuttle is thrown to the opposite side of the loom, the switch therein is thrown to open position, the magnet 28 thus reënergized and the pawl 24, released from the lug 23.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation.

Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described my invention, what I claim is:—

1. In a device of the class described, the combination with a lay, of a frame secured thereto, a reciprocating rod mounted in the frame, a magnet adapted to control the reciprocation of the rod, a connection between the rod and the shifter lever of the loom, a switch carried by the shuttle of the loom, contact members carried by the rod, and circuits connecting the contact and the magnet which are controlled by the switch in the loom to stop the reciprocation of the rod and operate the shifter lever.

2. In a loom, the combination with a source of current, open contacts mounted on the lay and connected to the source of current, a shifting switch, contacts carried by the switch and adapted to be engaged by said first mentioned contacts, and mechanism carried by the lay and controlled by the condition of the switch for stopping the loom.

3. In a loom, the combination with a source of current, brush contacts connected to the source of current, a switch carried by one of the shuttles of the loom, contacts on the shuttle connected to the switch, a magnet carried by the lay of the loom and in circuit with said brush contacts, said shuttle switch controlling the source of current to said magnet, and mechanism controlled by the magnet for stopping the loom.

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

HARRY W. WILLIAMS.

Witnesses:
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ED. DINSMORE.