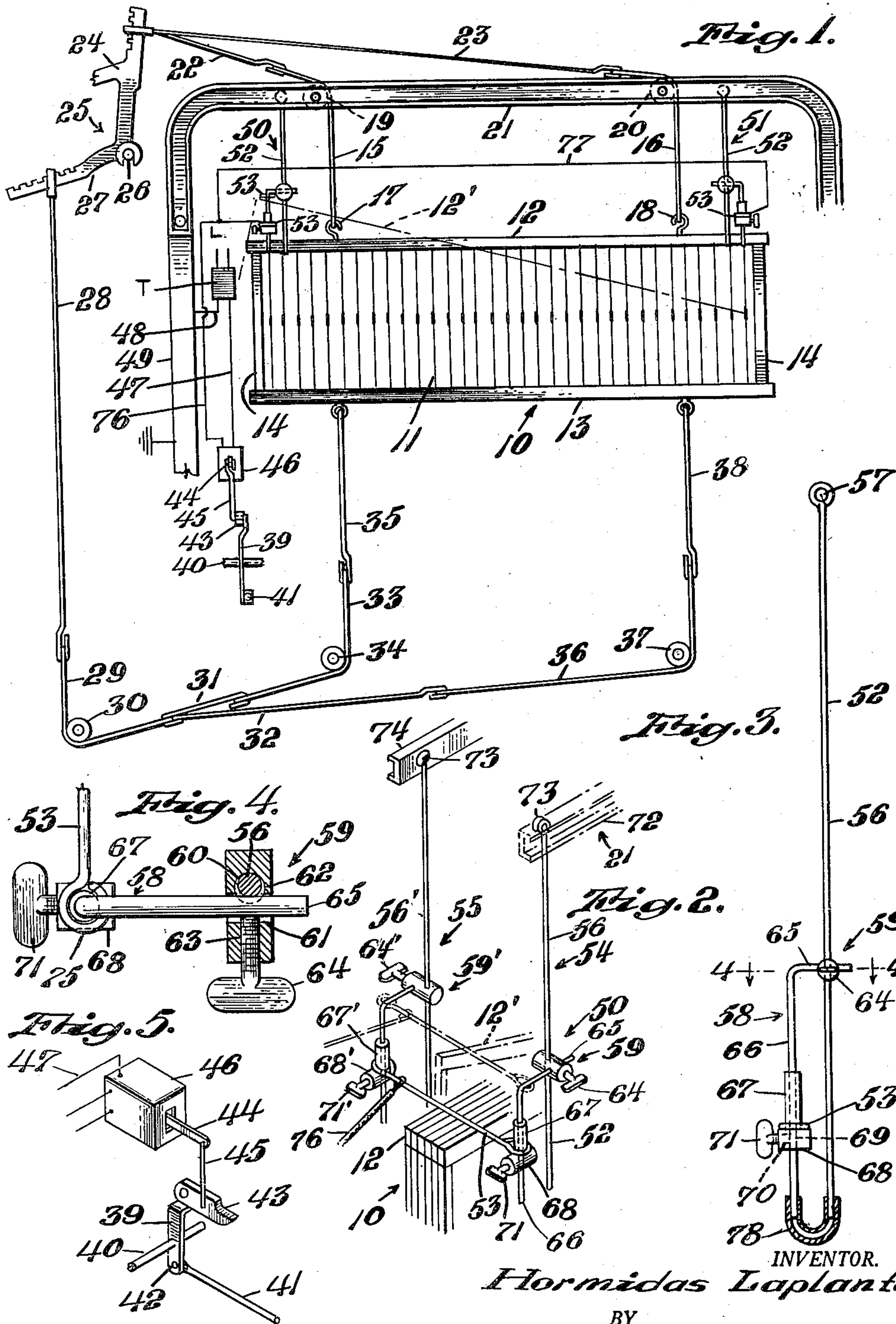


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HARNESS STOP MOTION

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## HARNESS STOP MOTION

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This invention relates to improvements in harness stop motion.

Electrical stop motions have been heretofore proposed which are adapted to be operated by an abnormal condition in harness frame connections, such as by a break therein, or when a substantial slack in the connections is had. Such prior construction has been presented in the horizontal extent of the harness connectors. In these prior constructions, spaced electric contacts are positioned beneath the loom to be engaged and bridged by the dropping of a bottom wire harness connector thereon due to a failure in the harness connections. The contacts are part of an electric circuit of a usual stop motion of a loom. The bridging of the contacts closes the circuit to actuate the stop motion. One of the disadvantages of such stop motion devices is that lint will fall thereon and soon pack on the contacts to such an extent as to prevent proper engagement thereof and render the device inoperative. Another disadvantage is that the device is not readily accessible at such a location as well as restricting the space which the loom fixer may require to occupy when repairing some particular element of the loom. It frequently happens in such instances that the loom fixer will disarrange some portion of the device by unintentional contact therewith, which may remain unseen and render the device inoperative.

An object of this invention is the provision of a stop motion wherein the electric contacts may be positioned to be engaged by the upper portion of a harness frame to close the electric circuit of the loom stop motion upon the tilting of the frame from the normal position.

Another object of the invention is the provision for controlling the electric circuit of the loom stop motion device at a location which is readily accessible.

Another object of this invention is the provision of means for controlling the electric circuit of the loom stop motion device so constructed as to be maintained relatively free of lint.

A more specific object of the invention is the provision of a stop motion for a loom wherein a pair of electrical contacts will be positioned above the harness frame of the loom to be engageable by the harness frame to close the circuit of the stop motion to stop the loom upon a breakage of the harness suspension means.

Another object of this invention is the provision of a stop motion device which can be manufactured at a comparatively low cost of produc-

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tion, and which will be durable and satisfactory in use.

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

In the accompanying drawings:

Figure 1 is a front elevation showing those parts of a loom only which are necessary to understand the invention, and with certain parts of the loom stop motion shown diagrammatically;

Figure 2 is a perspective view of a fragmental portion of the arch of the loom from which there is supported the contacts of the device embodying my invention;

Figure 3 is an elevation of one of the contacts shown in Figure 2;

Figure 4 is a sectional view taken substantially along line 4—4 of Figure 3, looking in the direction of the arrows; and

Figure 5 is a perspective view illustrating diagrammatically part of a loom warp stop motion device.

In carrying out one embodiment of my invention, I make the movable electrical contact of my harness stop motion of a relatively stiff length of electrical conducting wire. This contact I suspend in a horizontal position from a support depending from the arch of the loom so as to be positioned directly across the upper portion of the harnesses of the loom at one end thereof. The support is also made from relatively stiff electrical conducting wire and provides the other or stationary electrical contact and arranged for the contacts to be normally electrically insulated from each other. The movable contact is spaced from the harnesses a distance sufficient to prevent engagement thereof by the harnesses in the normal operation thereof. However, should there be a break in a harness connection, the harness affected will tilt about the other connection thereof as a pivotal point and engage the movable contact to carry the same upwardly into engagement with the stationary contact to close the electric circuit of a usual wire stop motion device provided on the loom and into which my harness stop motion is connected.

Referring to the drawings for a more detailed description of the invention, 10 designates one of a plurality of a conventional type harness frames for mounting the heddles 11 which support the warp in the process of weaving. The harness frame comprises upper and lower rails 12 and 13 which are secured to each other at their end por-



tions by uprights 14. The harness frame is suspended in position by flexible straps 15 and 16 which are attached to the upper rail 12 by spaced hooks 17, 18. These straps pass over guide sheeves 19, 20, which are usually mounted for free rotation on the arch 21 of the loom. The other end portion of the straps are attached by means of wire connectors 22 and 23 to the vertical arm 24 of a lever 25. The lever 25 is pivotally mounted for rocking motion about a shaft 26 and is part of the shedding mechanism of the loom.

The lever 25 or so-called harness jack, has a lower substantially horizontal arm 27, and has a vertical wire connector 28 attached thereto, the lower end of which is hooked to one end of a flexible strap 29. The strap 29 passes beneath a guide sheeve 30 with the other end thereof being connected to wire connectors 31, 32. The connector 31 is hooked to a strap 33 which passes under a guide sheeve 34 and then upwardly, having connections with the lower rail 13 through a wire connector 35. The wire 32 is similarly attached to a strap 36 which passes beneath a guide sheeve 37 to be connected by means of a wire 38 to the other end of the lower rail 13. This completes the connection between a harness frame and a harness jack 25 of the warp shedding mechanism. When the harness jack 25 is rocked about the shaft 26, the harness frame 10 will be raised and lowered to form the shed. The loom is provided with a multiple of such jacks and harness frames just described, there being a plurality of harness frames, each of which is provided with its own connection and harness jack.

The loom is also provided with an electrically operated warp stop motion which is illustrated diagrammatically in Figs. 1 and 5, and comprises generally a rocking lever 39 which is pivotally mounted on a rod 40 and has a control rod 41 pivotally mounted at its lower end as at 42. A so-called dagger 43 is pivotally mounted at the upper end of the lever 39 to be held in a raised or lowered position by an arm 44 and a connecting link 45. The arm 44 is operated to raise the dagger 43 by an electromagnet (not shown), contained in a housing 46. When the dagger 43 is raised by energizing the electromagnet, it is positioned in the path of movement of and engaged by a bunter on the lay or other moving part of the loom (not shown), to rock the lever 39. The rocking motion of the lever 39 is transmitted through the control rod 41 to actuate a loom mechanism (not shown), to stop and bring the loom to rest. Electrical current may be supplied to the electromagnet, such as by means of an electric circuit including line wires L, transformer T, a conductor 47 to the electromagnet, and a conductor 48 to some part of the loom structure, such as the side frame 49 to provide for a return branch to the transformer.

The harness straps and wire connectors form a closed loop and are maintained taut to positively control the movement and position of the harness frame as the harness jack is rocked. Should the harness connections become unduly slack or broken, the harness frame will drop or become misplaced, such as being tilted as shown in dot and dash line 12', so that it cannot properly shift the warps to form the shed.

In order to stop the loom upon the harness connection failure as above described, I provide a pair of electrical circuit closing devices 50 and 51. These devices are substantially similar to each other and are mounted above the rail 12 one

at each end portions thereof with one movable member of each device in a position to be engaged by the rail 12 of the harness upon the tilting of the harness to move the same into circuit closing position with another contact to bring the loom to rest. Since both devices are similarly constructed and also similarly supported from the arch 21 of the loom, only one pair thereof will be described in detail.

Each device 50, 51 comprises a stationary means 52 and a movable member 53. The stationary means 52 comprises two similar parts 54 and 55. The part 54 comprises a suspending link 56 provided with an eye 57 at one end thereof and made of a length of relatively stiff electrical conducting wire. An L-shaped member 58 also made of a similar electrical conducting wire is adjustably secured along the link 56 such as by means of a clamp device designated generally 59 (see Fig. 4). This clamp device 59 consists of a short length 60 of metal rod material having right angularly extending bores 61, 62 therethrough which intersect each other. A threaded bore 63 opens into the bore 61 and receives therein a thumb screw 64. The link 56 is slidably received through the bore 62 while the leg 66 extends downwardly substantially parallel and spaced from the link 56. The clamp 59 is adjustably secured along the length of link 56 by means of the screw 64 which engages against the offset 65 of leg 66 to force the offset against the link 56 which is moved thereby into tight engagement against the wall of the bore 62. An insulating bushing 67 is snugly received on the leg 66 to electrically insulate the portion of the leg 66 adjacent an insulating abutment 68 which may be of a fiber material having an opening 69 extending therethrough intersected by a threaded opening 70 in which is received a thumb screw 71 to secure the abutment in adjusted position along the length of leg 66 of the member 58. As previously indicated, the part 55 is similarly constructed and the like parts thereof are designated the same numeral plus prime. The part 54 is suspended from the front section 72 of the arch 21 by means of a bolt connection 73 and depends therefrom inwardly of the front harness frame and in spaced relation therewith. The part 55 is similarly suspended from the upper rear section 74 of the arch 21 and depends therefrom substantially parallel to and in line with the part 54 and to the rear of the rear harness of the group of harnesses which the loom may be provided with (see Fig. 2).

The movable contact 53 is made of a length of wire material and is provided at the ends thereof with eyes 75 which when in the inoperative or open circuit position encircle the insulating sleeve 67 and rest upon the insulation abutment 68. Thus, the movable contact 53 is positioned adjacent the end portion of a harness frame to be engaged by the upper rail 12 of the harness upon a defect or other abnormal conditions in the harness connectors previously described. The contacts 52 and 53 are placed in electric circuit of the usual warp stop motion device previously described by means of the loom frame to which the member 54 is attached, thence through conductor 48 to the transformer T, thence through conductor 47 to the electromagnet in the housing 46, from the electromagnet through conductor 76 to the movable contact 53. The other movable contact 53 of the pairs of devices 51 is electrically connected through conductor 77 to the conductor 76, while the stationary



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contact 52 thereof is placed in the circuit through the frame of the loom.

The operation of the harness stop motion above described is as follows: Should the harness connector become broken or loosened, the freed end of the harness will drop due to gravity and cause the opposite end thereof to be tilted, which positions the upper rail 12 into engagement with the contact 53 which upon further upward movement of the harness will raise contact 53 beyond the sleeves 67 and into engagement with the leg 66 or some portion thereof whereby to close the electric circuit to the electromagnet to actuate the warp stop motion in a manner previously described so as to bring the loom to rest. In mounting my device to be at a position above the harness frame, all portions thereof become readily accessible to the operator of the loom for adjustment thereof and to free the same of any lint which may become lodged thereon.

I have shown and described my invention in connection with the electrical warp stop motion which is usually provided on most looms; however, other electrically operated loom stopping means may be provided, if desired.

It is found desirable to provide a guard such as a rubber tubing 78 at the lower end of the contacts 52, to prevent possible injury to the weaver in the accidental contact therewith.

I claim:

1. In a loom having a loom frame and a harness frame, normally taut suspension means for operating said harness frame and holding the same in a general level position, an electrical stop motion for said loom including a circuit, a pair of electric contacts in said circuit suspended from said loom frame in a position adjacent the upper side of said harness frame, one of said contacts being elongated and extending laterally across the top of said harness frame and engageable by a portion of said harness frame to close the electric circuit of the stop motion to stop the loom upon a tilting of said harness frame from the level position when said suspension means be-

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come broken and means to adjust the position of said elongated contact with reference to said frame.

2. In a loom having a loom frame and a harness frame, normally taut suspension means for operating said harness frame and holding the same in a general level position, an electric stop motion for said loom including a circuit, a pair of electric contacts in said circuit suspended from said loom frame in a position adjacent the upper side of said harness frame, means normally electrically insulating said contacts, one of said contacts being elongated and extending laterally across the top of said harness frame and engageable by a portion of said harness frame to be moved thereby beyond said insulating means to close the electric circuit of the stop motion to stop the loom upon a tilting of said harness frame from a level position when said suspension means become broken.

3. In a loom having a loom frame and a harness frame, normally taut suspension means for operating said harness frame and holding the same in a general level position, an electrical stop motion for said loom including a circuit, a pair of electric contacts in said circuit suspended from said loom frame in a position adjacent the upper side of said harness frame, and slidably related to each other and engageable by a portion of said harness frame to close the electric circuit of the stop motion to stop the loom upon a tilting of said harness frame from a level position when said suspension means become broken.

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