

1,065,938.

3 SHEETS--SHEET 1.



John Hancz
By Arthur Baldwin.

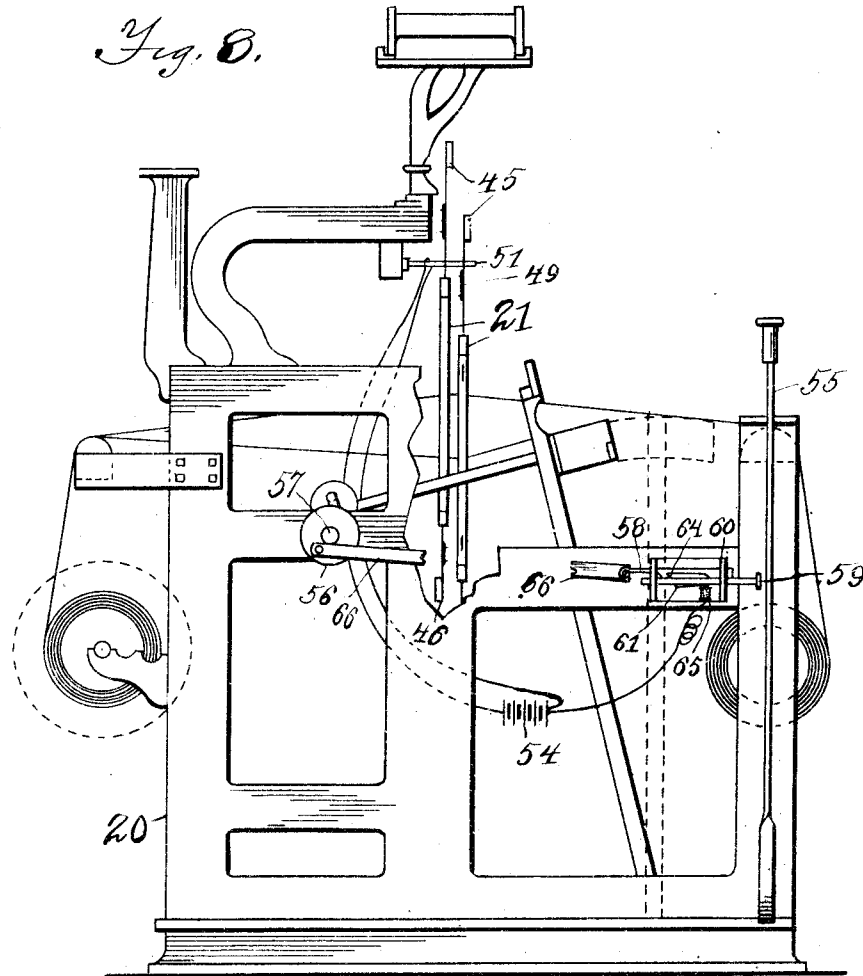
Attorney

J. HANCO.
ELECTRIC WARP STOP MOTION.
APPLICATION FILED NOV. 25, 1912.

1,065,938.

Patented July 1, 1913.

3 SHEETS—SHEET 2.



Witnesses

Arthur R. Moore
H. A. Sandberg

Inventor

John Hanco
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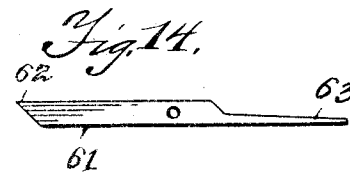
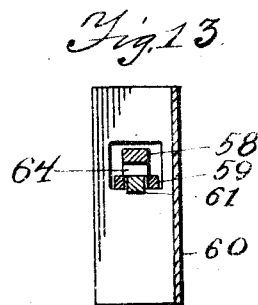
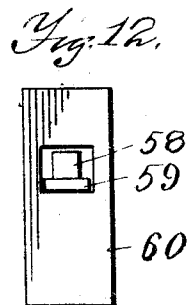
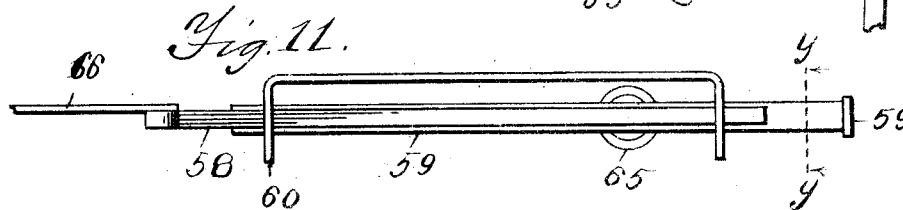
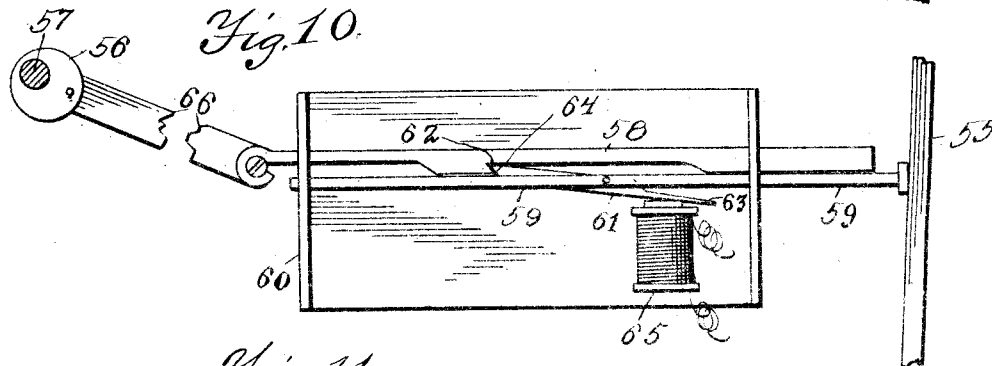
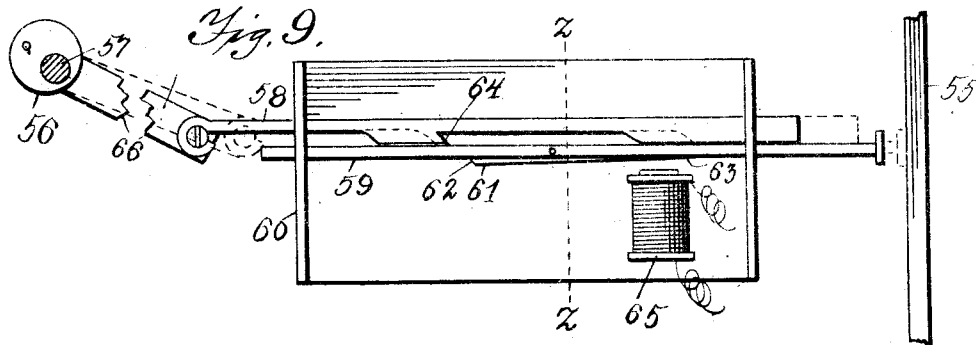
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3 SHEETS—SHEET 3.



Inventor

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UNITED STATES PATENT OFFICE.

JOHN HANCQ, OF JAMESTOWN, NEW YORK.

ELECTRIC WARP STOP-MOTION.

1,065,938.

Specification of Letters Patent.

Patented July 1, 1913.

Application filed November 25, 1912. Serial No. 733,256.

To all whom it may concern:

Be it known that I, JOHN HANCQ, a citizen of the United States, residing at the city of Jamestown, in the county of Chautauqua and State of New York, have invented certain new and useful Improvements in Electric Warp Stop-Motions, of which the following, taken in connection with the accompanying drawings, is a specification.

The invention relates to electric warp controlling devices for looms and is an improvement upon the warp stop motion shown in application of the applicant filed April 15, 1912, Serial No. 690,712; and the object of the present improvement is to simplify and render more efficient the former construction of the applicant; and to these ends the invention comprises the novel features hereinafter set forth and claimed.

In the drawings, Figure 1 is an elevation of a heddle frame with the heddles in position, the middle portion of the frame being broken away and showing the electrical connection whereby the electrical circuit is alternately made and broken with the rise and fall of the frame in the loom; the frame being shown in the lowered position thereby completing the electrical circuit. Fig. 2 is a sectional view of the frame at line X X in Fig. 1, showing the heddle as it is normally supported on the thread and not resting upon the electrical contact, that is, with the frame in the lowered position; and Fig. 3 is a similar view with the heddle resting upon the contact strip and the thread broken. Fig. 4 is an elevation of a portion of the end of the heddle frame with the electrical connection disconnected or with the frame in the raised position. Fig. 5 is a perspective view of the electrical contact pins with the parts in the closed position when the frame is lowered; and Fig. 6 is a similar view with the parts in the open or disconnected position when the frame is raised. Fig. 7 is a sectional view of the contact strip and supporting flange on the under edge of the top cross rail of the frame. Fig. 8 is an end elevation of the loom with the electrical warp stop motion attached thereto. Fig. 9 is a detail elevation of the magnetic tripping means for operating the stopping mechanism of the loom, the tripping mechanism being shown in the normal position with unbroken threads; and Fig.

10 is a similar view showing the action of the magnet when the thread breaks in tripping the stopping mechanism of the loom; and Fig. 11 is a plan view of said tripping mechanism. Fig. 12 is a sectional view at line Y Y in Fig. 11, showing the relation of the parts. Fig. 13 is a sectional view at line Z Z in Fig. 9. Fig. 14 is a detail elevation of the tripping plate removed from the other mechanism.

Like numerals of reference refer to corresponding parts in the several views.

The numeral 20 designates the loom frame upon which the heddle frames 21 are supported in the usual manner. The heddle frames 21 comprise the top cross rails 22 and the bottom cross rails 23 which are connected by the end pieces 24 and 25. The heddle frame 21 is preferably made of fiber or wood or some other equally good insulating material. The top and bottom cross rails 22 and 23 have the sheet metal single hooked lengthwise flanges 26 and 27 inset lengthwise in their opposite inner edges. The top flange 26 is preferably made of two sheets of metal placed side by side and the inner edge given a return bend to give the proper single hooked form desired. The edges 28 and 29 of the sheet metal spread apart and a contact strip 30 is inserted therebetween with suitable insulation 31 from the edges 28 and 29. The contact strip 30 extends the full length of the flange 26 and above the edges 28 and 29 a sufficient distance to insure a contact with the heddle 32.

The heddle 32 is preferably made of sheet steel, though it may be made of wire and not depart from my invention. A thread eye 33 is provided in the middle portion of the heddle for the thread 34, the ends of the heddle 35 and 36 are turned to one side preferably in an angular return bend thereby forming a hook which fits over the hooked flanges 26 and 27. The length of the heddle 32 is spaced according to the hooked flanges 26 and 27 so that the hooked end 35 will rest firmly on the contact strip 30 when the thread breaks, as shown in Fig. 3, the angular end insuring an electrical contact and stopping the loom.

The heddle frame 21 is supported on the loom by means of hooks 37 and 38 in the top cross rail 32 and by hooks 39 and 40 in the bottom cross rail 23. The electrical con-

nection to the frame 21 might be made through the lower hooks 39 and 40. It is here shown as made through the top hooks 37 and 38. It is immaterial which pair of hooks are used except that the heddles 32 always make and break contact with the flange 26 on the top rail.

A groove 41 is provided in the end of the top rail 22 and continues in a hole through the end piece 24 with a return hole through said end piece within which the wire 42 is placed for connecting the hook 37 to the end of the contact plate 30 without coming in contact with the upper edge 24 of the metal flange 26. The hook 38 has contact with the upper edge 44 of the metal flange 26 at 43.

The heddle frame is supported between the upper levers 45 and the under levers 46 by means of wire links 47 and 48, which links connect the hooks 37 and 38, 39 and 40 to the insulating links 49 and links 50 which connect to said levers 45 and 46. A pair of contact pins 51 and 52 are provided alongside each of the links 47 and a contact wire 53 is pivotally attached to each of said links 47 and given a turn around the pin 51. The ends of the contact wires 53 extend out beneath the pins 52 which pins 52 are connected by suitable wire to the opposite poles of the battery or series of electrical supply 54, thereby connecting the hooks 37 and 38 to the opposite poles of the battery 54.

It is now apparent that when the heddle frame 21 is raised and lowered by the levers 45 and 46 the connecting links will move upward and downward therewith including the links 47, thereby raising and lowering the ends of the contact wires 53 and making and breaking the electrical contact with the pins 52 as the ends of the contact wires 53 are pressed against or move away from the pins 52 by said upward and downward movement of the heddle frame. The heddles 32 will be supported upon the threads 34 when the heddle is lowered thereby breaking the contact between the upper ends 35 with the contact strip 30, and when in this lowered position it is apparent that contact is made by the wires 53 on the pins 52. As the heddle frame 21 moves upward the wires 53 will be moved out of contact with the pins 52 and simultaneously the heddles 32 will be lowered onto the contact strip 30, thus it will be seen that the circuit will continue to remain broken either at one place or the other during the normal operation of the loom with unbroken threads.

The operation of the different parts has been described when normally working with unbroken threads and it is evident that the electric circuit must be continually disconnected when the loom is running with unbroken threads, for as soon as the circuit is closed the brake mechanism will be oper-

ated; thus when the thread breaks with the heddle frame in the lowered position, as shown in Fig. 2, the heddle will immediately fall upon the contact strip 30 thereby closing the electrical circuit and operating the brake mechanism and stopping the loom. Should the heddle frame be in the raised position, as shown in Fig. 3, with the heddles 32 resting on the contact strip 30 and the contact wires 53 out of contact with the pins 52, as shown in Figs. 3 and 4, when the thread breaks the continued movement of the loom would almost immediately lower the heddle frame thereby bringing the wires 53 into contact, and the heddle 32 with the broken thread would remain in contact with the strip 30 thereby completing the circuit, thus insuring the stoppage of the loom whatever the position of the parts when the thread breaks.

The stopping mechanism for the different styles of looms is usually operated by means of a lever or crank and shaft. A small tripping mechanism is shown by which to electrically operate the lever or crank. A lever 55 is shown in the drawings herewith, but it is apparent that a shaft with a crank or arm may be turned in precisely the same manner that the lever 55 is moved.

A crank arm or wheel 56 is attached to the crank shaft 57 of the loom and a pitman 66, and a bar 58 is pivotally attached to the pitman 66 and slidably mounted on a second bar 59, which is supported in a bracket piece 60 on the frame 20 of the loom alongside the lever 55. The bar 59 extending to within a short distance of the lever 55 to be pressed thereby against the bar 58 when the thread breaks in the following manner: The bar 59 is pivotally mounted in the tripping plate 61 and end 62 of the tripping plate is made heavy, while the end 63 is made light to normally balance the tripping plate 61 downward at end 62 and out of the way of bar 58. Bar 58 has a tooth 64 cut thereon in close proximity to the end 62 of the tripping plate 61 so that as bar 58 is moved backward and forward, as shown in dotted line in Fig. 9, by means of the crank 56, the tooth 64 will pass backward and forward over the end 62 of the tripping plate 61. A magnet 65 is placed on the bracket piece 60 beneath the end 63 of the tripping plate 61, and when the thread breaks and the electrical circuit is thereby complete, as hereinbefore described, the electrical current passes through the magnet 65 thereby empowering the magnet 65 to draw downward on the end 63 of the tripping plate 61, thereby tipping the end 62 upward into the path of the tooth 64 and is engaged thereby and causes the bar 59 to unite with the bar 58 in its reciprocating movement thereby pressing the bar 59 against the

lever 55 and giving said lever the required movement to operate the stopping mechanism of the loom.

I claim as new—

5 1. In a device of the class described, a heddle frame comprising upper and lower cross bars and connective end pieces, lengthwise hooked flanges on the inner edges of said upper and lower cross bars, heddles
10 having hooked ends to engage over said hooked flanges, a contact strip on said upper hooked flange insulated therefrom and projecting upwardly therefrom to receive the hooked end of said heddle, said hooked
15 flange and said contact strip having separate connections to the source of electrical energy.

2. In a device of the class described, a heddle frame comprising upper and lower
20 cross bars and connective end pieces, lengthwise flanges on the inner edges of said upper and lower cross bars having their inner edges in a return bend, the edge of the upper flange spread apart, a contact strip inserted between said spread apart edges and
25 insulated therefrom, said upper flange and contact strip having separate connections to the source of electrical energy, heddles having angular hooked ends to engage over

said contact strip and insure resting against 30 and coming in contact with said upper flange.

3. In a device of the class described, a heddle frame comprising end and cross rails of insulating material, sheet metal plates 35 inserted lengthwise of the opposite inner edges of said cross rails, two plates side by side in the upper cross rail and a single plate in the lower cross rail, the inner edges of said plates turned in a single lengthwise 40 return bend, the edges of the two plates in the upper cross rail spread apart to receive therebetween insulating material, a contact plate embedded in said insulation and separated from said spread apart plates and extending 45 above the same, a heddle having a downwardly inclined angular hooked end to insure resting against said spread apart plate when it drops upon said contact plate, substantially as and for the purpose specified. 50

In testimony whereof I have affixed my signature in the presence of two witnesses.

JOHN HANCOCK

Witnesses:

H. A. SANDBERG,
MARY D. MILLER.