May 12, 1936. A. S. ROBINSON 2,040,565

SET MARK PREVENTER FOR LOOMS

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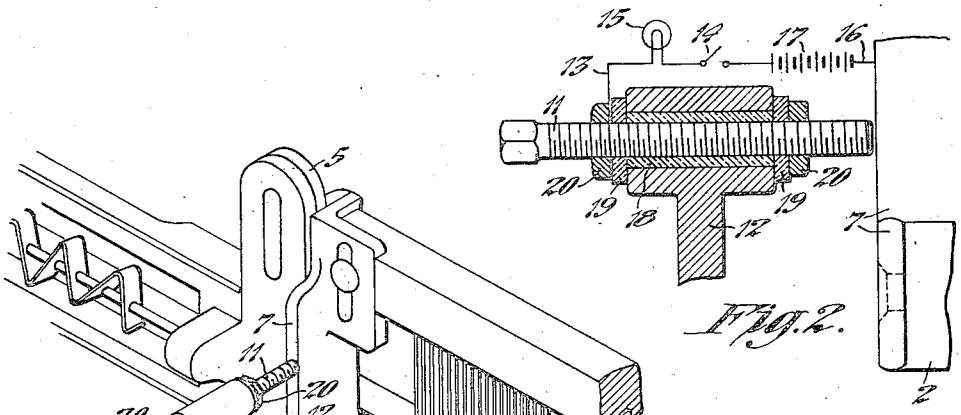


Fig. 2.

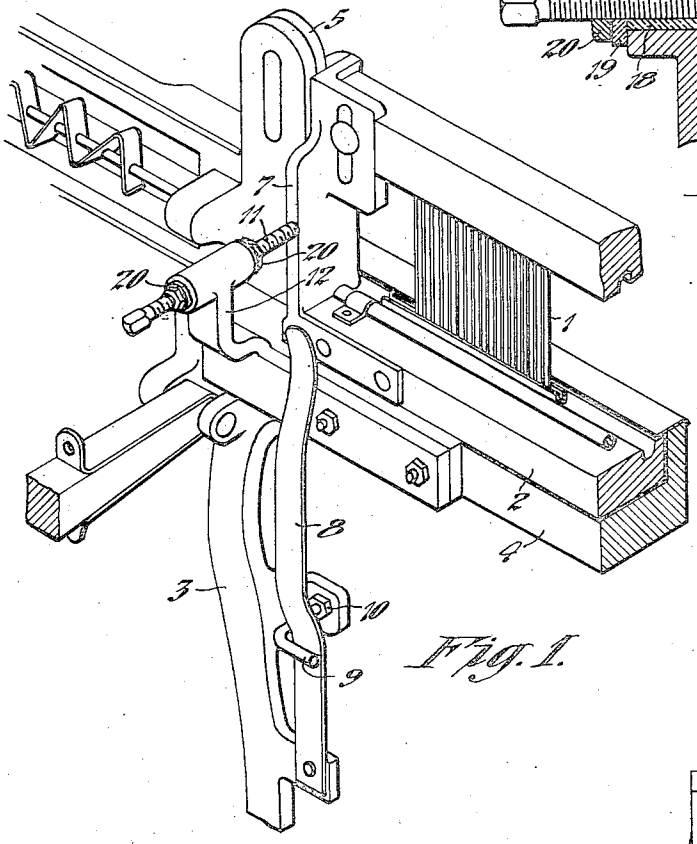


Fig. 1.

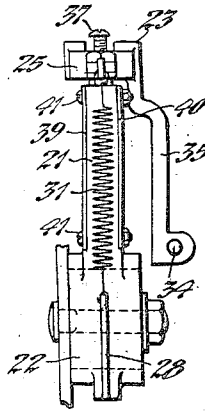


Fig. 4.

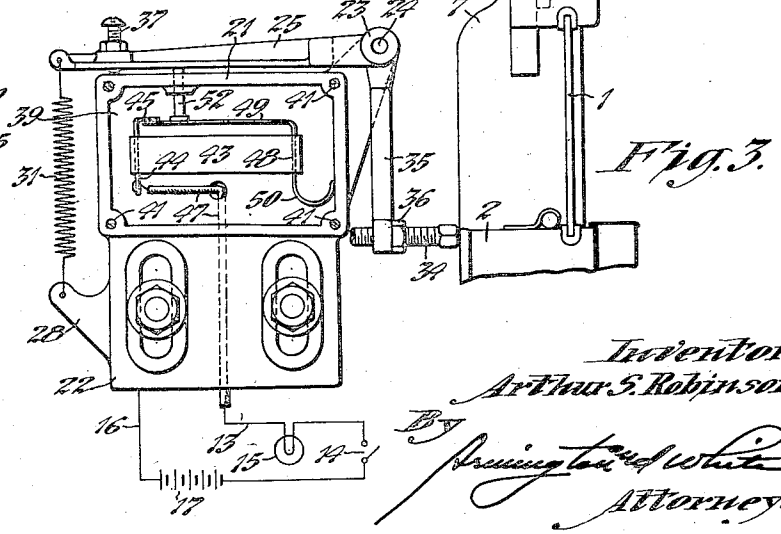


Fig. 3.

Inventor:
Arthur S. Robinson
By Pennington and White
Attorneys.

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SET-MARK PREVENTER FOR LOOMS

Arthur S. Robinson, Astoria, N. Y.

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7 Claims. (Cl. 139—1)

This invention relates to looms and particularly to a device, hereinafter referred to as a "set-mark preventer", for eliminating imperfections, blemishes or so-called "set marks" in the cloth being woven.

When certain faults occur during the weaving operation, and particularly when these faults require "pickouts", the cloth in the loom must be properly set in relation to the reed to provide that the first pick of the loom in continuation of the interrupted weaving will lay the filling in correct proximity to the filling laid by the last complete pick before weaving was interrupted. If the filling thread is laid too close to that previously woven a mark or streak will appear across the cloth and if it is laid too far away from the previous pick a space or "thin mark" will be present. Particular skill and expertness are usually required to effect repeated joining of the threads with uniform accuracy and perfection.

The principal object of the present invention is to provide a device of the type indicated which makes possible repeated joining of the filling threads with uniform accuracy in the shortest space of time and without particular skill on the part of the weaver.

Further objects of the invention are set forth in the following specification which describes two preferred forms of construction of the device, by way of example, as illustrated by the accompanying drawing. In the drawing:

Fig. 1 is a perspective view of a portion of a loom showing the present improved device as applied to use therewith;

Fig. 2 is a vertical sectional view of the adjusting means for the device;

Fig. 3 is a side elevation of a modified form of the device; and

Fig. 4 is an end elevation of the device shown in Fig. 3.

Referring to the drawing, Fig. 1 illustrates only those parts of the loom to which the present device is directly related, the reference character 3 designating the usual sword which carries the reed 1, reed-holder 2 and the lay 4. The reed-holder 2 is constructed with end-members 7 pivoted to blocks 5 mounted on the swords 3, the connections at one end only being herein illustrated; it being understood that the structure shown in Fig. 1 is duplicated at the opposite side of the loom. The reed-holder 2 is held to its normal weaving position by a spring 8 mounted on the sword 3. The tension of the spring 8 is adjusted by means of a bolt 9 and nut 10 so that the reed 1 may properly react and yield to the tensional resistance of the cloth in beating up the filling.

The present device forms part of an electrical circuit having one side grounded in the loom frame. The reed-holder end-member 7, pivot-block 5 and sword 3 are constructed from metal to provide conductors through which the electric current flows to the frame of the loom.

Referring to Figs. 1 and 2, the present device is herein shown in its simplest form as comprising a screw 11 mounted adjacent the metal reed-holder end-member 7 in a bracket 12 which is attached to the lay 4 of the loom. The screw 11 constitutes the terminal of one side of the electrical circuit, see Fig. 2, this side 13 of the circuit having a switch 14 and a signal, preferably an electric lamp 15, connected therein. The opposite side 16 of the circuit connects the source of electrical energy 17 with the reed-holder end-member 7 by way of the loom frame to which the end-member is metallically connected. The bracket 12, being mounted on a metal part having metallic and electrical connection with the loom side, it is necessary that the contact-screw 11 be suitably insulated therefrom. As shown in Fig. 2, the screw 11 may be enclosed by and insulated from the bracket 12 by a sleeve or bushing 18 of suitable dielectric material. Insulating washers 19 separate two adjusting nuts 20 on the screw 11 from the ends of the bracket 12. By turning the nuts 20 the contact-screw 11 may be adjusted in proper position with respect to the reed-holder end-member 7.

When the cloth is properly set in the loom the reed 1 and reed-holder 2 yield slightly with every pick as each filling thread is "beat up". The lateral movement resulting from such yield is sufficient to close a set "gap" between the reed-holder end-member 7 and the end of the contact-screw 11, thereby closing the electrical circuit. When the switch 14 is closed the signal-lamp 15 will light to indicate that the circuit has been closed by contact of the reed-holder end-member 7 with the end of the screw 11. In the use of the device, the cloth and warp ends are tightened to the proper tension and the take-up of the loom then manipulated until, with the impact of the reed 1 against the filling as in beating up, the signal-lamp 15 is just lighted. The correct setting for a proper joining of the filling threads have been once determined and the adjustments effected, the same joining of the filling threads may be repeated indefinitely with great accuracy. After the parts have been adjusted the switch 14

is opened to render the lamp 15 inoperative until another joining must be made.

Figs. 3 and 4 illustrate a modified form of construction of the device, particularly adapted for use with fine and light weaves as being more sensitive in adjustment and operation. The relation of the device shown in Figs. 3 and 4 to the reed-holder 2 is the same as that previously described in connection with the device shown in Figs. 1 and 2 and its manner of functioning is only slightly different. In the operation of the first described device the closing of the electrical circuit is effected by positive pressure of the reed-holder 2, while in the embodiment shown in Figs. 3 and 4 the circuit is closed by other means controlled by the movement of the reed-holder 2.

A substantially rectangular frame 21 is formed integral with a bracket 22 bolted to or otherwise suitably attached to the lay-sword 3. Pivotally mounted at 24 on the frame 21 is a bell-crank lever 23, the upper arm 25 of which extends horizontally above the top of the frame 21 and projects beyond its end. A spring 31, having one of its ends attached to the end of the arm 25 and its opposite end secured to an ear 28 projecting from the side of the bracket 22, normally draws the arm 25 downwardly toward the top of the frame 21. Downward movement of the arm 25 tends to hold the end of an impact-screw 34 carried at the bottom of the depending vertical arm 35 of the bell-crank lever 23 toward the reed-holder end-member 7. The impact-screw 34 is constructed with relatively fine threads to provide for minute adjustments and to guard against loosening due to vibration. A check-nut 36 is provided on the screw 34 for securing it in its adjusted position.

Fiber plates 39 and 40, secured to the sides of the open frame 21 by means of screws 41, form a compartment within which is located an electric contact-device arranged as next described. Attached to the plate 39 is a fiber block 43, to one end of which is secured a metal contact-element 44. The element 44 is positioned with its upper bent portion or arm 45 extending at right-angles above the block 43. A wire 47 attached to the lower end of the contact-element 44 connects it to one side 13 of the electrical circuit. To the opposite end of the block 43 is attached a contact-element 48 formed with a bent spring arm 49 extending parallel with the top of the block 43 to underlie the contact-arm 45 of the element 44. The opposite or lower end 50 of the element 48 is of arcuate formation to adapt it to bear against the inner surface of the frame 21 whereby to ground it in the loom frame.

Slidably mounted in a hole in the upper wall of the frame 21 is a pin or plunger 52 arranged to rest upon the contact spring-arm 49 near its point of encounter with the overlapping end 45 of the contact-element 44. The upper end of the pin 52 extends above the frame 21 into engagement with the underside of the lever arm 25. Normally, the downward pull of the spring 31 causes the arm 25 and pin 52 to depress the end of the spring-arm 49 from contact with the arm 45. A screw 37 carried on the lever-arm 25 is adapted to strike against the top of the frame 21 to limit the downward movement of the arm. By adjusting the screw 37 in the arm the gap between the contact spring-arm 49 and the contact-arm 45 may be varied for a purpose as later explained.

In the use of this modified form of the device the switch 14 of the electrical circuit is first closed and the lay moved to extreme forward position to press the reed against the cloth as when beating up a pick. With the lay in extreme forward position the impact-screw 34 is screwed against the reed-holder end-member 7 to adjust the bell-crank lever 23 to release the spring-arm 49. The arm 49 will thereupon spring into engagement with the contact 45 to close the circuit to light the lamp 15. It will be understood that by adjusting the stop-screw 37 on the lever 23 the opening or gap between the contacts 45 and 49 may be regulated in accordance with the nature of the weave and the type of filling being employed.

Upon completion of the above described adjustment the device is ready for operation and when joining of the threads becomes necessary the take-up is manipulated until the lamp 15 lights to indicate the correct location of the fell of the cloth before starting the loom. Heretofore, satisfactory joinings have depended upon the skill and careful attention of the weaver. In weaving fabrics from synthetic yarns or other materials susceptible to damage from excessive handling extreme care and concentrated scrutiny has always been necessary to avoid blemishes and "set-marks" in the fabric.

It will be observed from the foregoing that the present invention provides an extremely simple yet highly efficient device for the purpose indicated. By its use, when the picking sequence in weaving has been interrupted or lost through any cause such as exhausted filling and broken picks or through some fault which necessitates "picking out" the resetting of the cloth may be accurately and most conveniently accomplished.

The invention thus operates to prevent "set-marks" in the woven cloth to eliminate blemishes from this cause, thereby improving the quality of the product of the loom. Moreover, with the use of the present improved device the weaver is relieved of the tedious and exacting task of setting the cloth by trial to properly join the threads of the fabric and thus fatigue is avoided and the operation expedited to increase the production of the loom.

While I have herein shown and described the device as embodied in two preferred forms of construction, it is to be understood that further modifications may be made in the structure and arrangement of the parts without departing from the spirit or scope of the invention. Therefore, without limiting myself in this respect, I claim:

1. In a set mark preventing device, the combination in a loom with its reciprocating lay, its reed mounted on the lay and having movement additional to the motion thereof, reaction means carried with the lay for holding the reed to the cloth in beating up the filling while permitting elastic recession of the reed upon encountering the cloth, of an electrical circuit, a signal operative from said circuit, and means actuated by said reed at the end of its movement of recession in beating up the filling to control the circuit to operate the signal.

2. In a device of the type indicated, the combination in a loom with its reciprocating lay, a reed mounted on the lay to swing thereon independently of the lay's reciprocation to react to the pressure of beating up the filling against the cloth, and resilient pressure means to swing the reed against the cloth when beating up the fill-

ing, of an electrical circuit, an electrical signal operative from said circuit, and means actuated by said reed at a predetermined point in its range of movement of reaction to the beating-up pressure to control said circuit to operate the signal and thereby indicate the correct beating-up pressure.

3. In a device of the type indicated, the combination in a loom with its reciprocating lay and reed-holder movable on said lay, of an electrical circuit, an electrical signal in said circuit, and means engaged by the reed-holder to close the circuit at a predetermined point in the range of movement of the reed-holder with respect to the lay to operate said signal.

4. In a device of the type indicated, the combination in a loom with its reciprocating lay and reed having movement additional to its movement with the lay, of an electrical circuit, a signal connected in the circuit, adjustable means engaged by said reed at a predetermined point in its additional movement on the lay to close said circuit to operate the signal, and a mounting to secure the adjustable means to the loom.

5. In a device of the type indicated, the combination in a loom with its reciprocating lay and reed movable with respect to the lay on encountering the cloth in beating up the filling, of an electrical circuit, a signal included in said circuit, means moving with the lay to be actuated by the reed at a predetermined point in its movement of reaction to pressure against the cloth to close the circuit and operate the signal, and means for mounting said circuit-closing means to move with the lay.

6. In a device of the type indicated, the combination in a loom with its reciprocating lay and reed subject to movement with respect to the lay, of an electrical circuit, a signal in said circuit, a contact-member connected with one side of said circuit, a contact-spring connected with the opposite side of said circuit, means operated by the reed in its movement to cause closing of the contacts to energize the circuit and operate the signal, and means to mount said circuit-closing means on the lay.

7. In a device of the type indicated, the combination in a loom with its reed and movable reed-carrier, of an electrical circuit in cooperation with the loom, a signal in the circuit, a fixed terminal contact for the circuit, a spring contact normally encountering the fixed terminal contact, a lever, means moved by the lever to separate the spring contact from the terminal contact, a spring connected with the lever to move the latter and effect such separation, and an adjustable screw in said lever arranged with its extremity engaging the reed-holder to be moved by movement of the latter to withdraw pressure from the contact-spring and permit it to engage the fixed terminal contact to operate the signal.

ARTHUR S. ROBINSON.