No. 623,174. Patented Apr. 18, 1899.

J. H. NORTHROP.

STOPPING MECHANISM FOR LOOMS.

(Application filed Dec. 9, 1898.)

(No Model.)

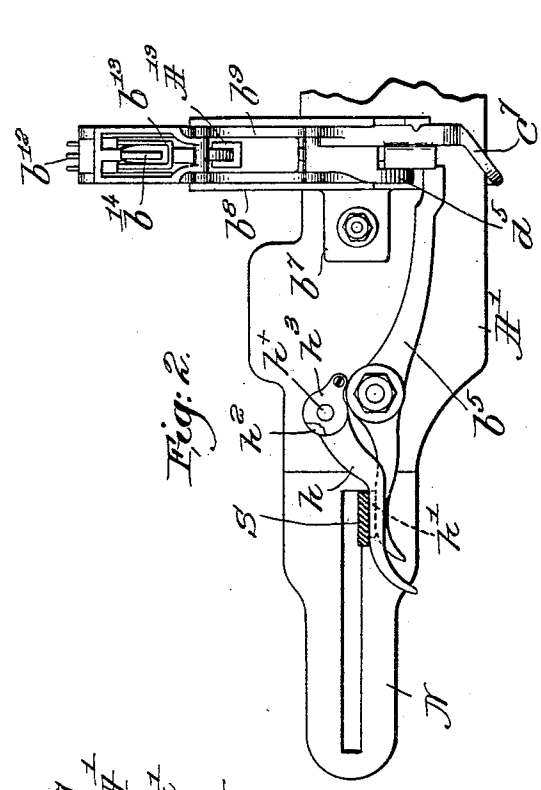

Fig. 2.

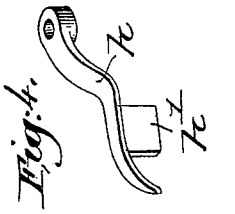

Fig. 4.

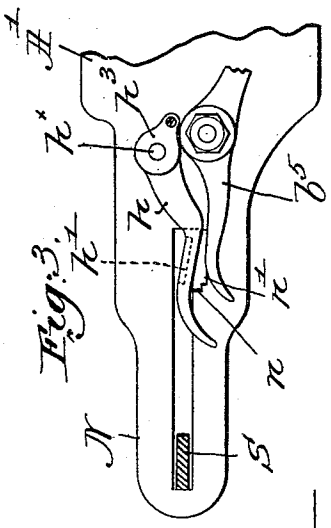

Fig. 3.

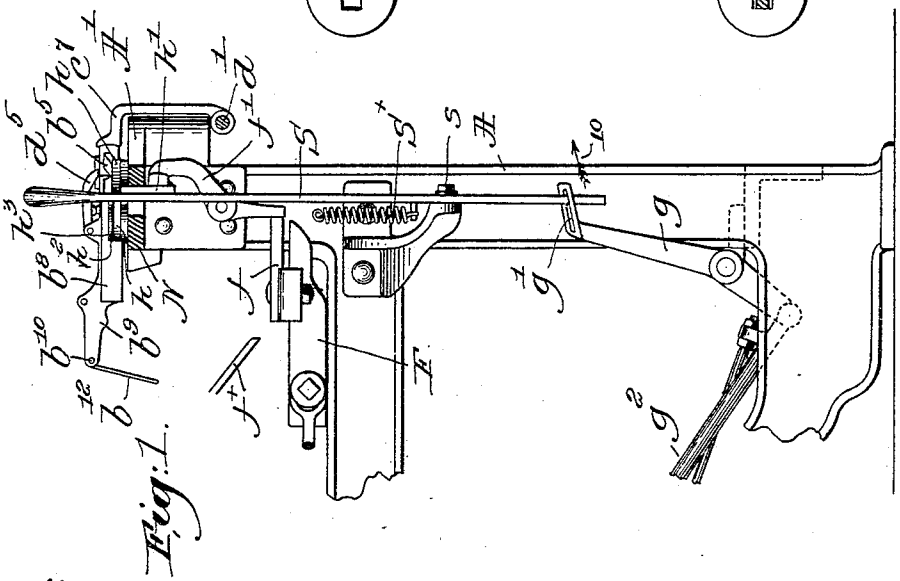

Fig. 1.

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UNITED STATES PATENT OFFICE.

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STOPPING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 623,174, dated April 18, 1899.

Application filed December 9, 1898. Serial No. 698,696. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. NORTHROP, of Hopedale, county of Worcester, State of Massachusetts, have invented an Improvement in Stopping Mechanism for Looms, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

It is now the custom to provide looms with several different stop-motion mechanisms all acting on a common part, such as the shipper-lever, to automatically stop the loom upon the occurrence of some one or more faults. Thus warp and weft stop-motions are provided to stop the loom upon failure of either a warp-thread or the weft, and protector mechanism is also provided to effect stoppage when the shuttle is improperly boxed, and whatever the cause of the stoppage the shipper-lever is released from its holding-notch to ship the belt. As the stoppage of the loom may thus result from any one of several causes, it will be obvious that there is nothing to indicate to the attendant which cause has been operative to release the shipper-lever and stop the loom, and consequently the various parts of the mechanism must be examined in order to obtain such information and remedy the fault.

When an attendant has charge of a number of looms, the rapidity with which one or more of them can be set in motion after stoppage is very largely dependent upon the facility with which the particular fault can be discovered, and the greater the number of looms in operation the greater the output.

This invention has for its object the production of simple and effective means for indicating to the attendant the cause of the stoppage, whether due to a fault in the weft or warp or due to the operation of the protector mechanism.

Figure 1 is a left-side elevation of a sufficient portion of a loom to be understood with my present invention embodied therein, the notched holding-plate for the shipper-lever being shown in section. Fig. 2 is an enlarged top or plan view thereof, the shipper-handle being shown in section. Fig. 3 is a similar view of the holding-plate, the knock-off lever controlled by the weft, and the stop-indicator, the shipper having been released by the operation of the protector mechanism; and Fig. 4 is a perspective view of the stop-indicator.

The loom-frame A, breast-beam A′, provided with the notched holding-plate N for the shipper-lever S, the knock-off lever b^5, operated upon failure of the weft, to release the shipper-handle, the frog-holder F, actuating-dagger $f^\times$, Fig. 1, the frog f, and the cooperating knock-off lever f', constituting the usual protector mechanism, operative when the shuttle is not properly boxed to release the shipper-lever, may be and are of usual or well-known construction.

The stand b^7, guide b^8 for the weft-fork slide b^9, the weft-fork b^{12}, pivoted on the stand at b^{10}, the tail of the fork b^{13}, adapted at times to be engaged by a hook b^{14}, pivoted on the weft-hammer A^{19}, Fig. 2, the latch d^5 to engage and move the knock-off lever b^5 upon a second successive failure of the weft to tip the fork, the operating-shaft d' for the filling-supplying mechanism, (not shown,) and the arm c^7, connected with and to rock said shaft by the outward movement of the weft-fork slide b^9, are herein shown substantially as in United States Patent No. 529,943, dated November 27, 1894, like parts herein having the same reference-letters.

The holding-notch n in the path N is herein shown as increased in width for a part of its length, as at n', Fig. 3, to receive a depending fin or lug h', forming a part of the stop-indicator, shown as an arm h, pivoted at $h^\times$ on the breast-beam, and preferably acted upon by a suitable friction pad or washer h^2, Fig. 2, held in place by a cap h^3, attached to the breast-beam.

When the shipper-handle is in the notch n, the finger h' of the stop-indicator rests in the depression n' of the notch against the shipper-lever, and the outer end of the knock-off lever b^5 abuts against the outer face of the finger, as in Figs. 1 and 2, so that the latter is interposed between the shipper-lever and the lever b^5. At the same time the protector knock-off lever f' rests against the finger, which projects below the plate N sufficiently for the purpose, as clearly shown in

Fig. 1, and when the loom is running properly the parts will be in the position shown in Figs. 1 and 2. If now the protector mechanism is operated, the lever f' will be turned to push inwardly against the finger h', turning the stop-indicator into the position shown in Fig. 3, and thereby forcing the shipper-lever out of the holding-notch n to move into stopping position by the action of its spring $S^{\times}$, Fig. 1. The knock-off lever b^5 has not been moved, and the attendant by glancing at the stop-indicator sees that it alone has been moved, and he at once knows that the protector mechanism has operated and that the fault is in the shuttle. On the other hand, if the weft-fork mechanism had operated, due to failure of the weft, the latch d^5 would have swung the knock-off lever b^5, and the latter would then act through the finger h' to release the shipper-handle, and both the knock-off lever b^5 and the stop-indicator h would be in abnormal position, showing the attendant that the fault was with the filling.

As herein shown, the lower end of the shipper-lever extends below the pivot s, Fig. 1, on which it is loosely mounted in usual manner, and enters an inclined slot g' in the upper end of a rocker-arm g, controlled as to its movement by suitable warp-stop-motion mechanism, a link g^2, forming a part thereof, serving to at times move the rocker-arm g. Should a warp-thread break or become unduly slack, the warp-stop-motion mechanism will operate to swing the upper end of the rocker-arm g in the direction of arrow 10, Fig. 1, and the inclined edge of the slot g' will act on the shipper-lever below its fulcrum to move the upper end of said lever inward or out of its holding-notch, and the loom will be stopped. Under such circumstances the stop-indicator remains in normal position, and consequently the attendant knows at once that neither the protector mechanism nor the weft-fork mechanism has operated to release the shipper-lever, and that the fault must consequently be in the warp. Thus by the position of the stop-indicator the particular fault which has caused the loom to stop is at once made plain to the attendant and the particular fault can be remedied without necessitating an examination of the various parts of the loom.

My invention is not restricted to the particular form of weft or warp stop-motion mechanism shown nor to the particular protector mechanism.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a loom, a shipper, a plurality of independent mechanisms constructed and arranged to individually operate, a knock-off lever for each mechanism, and a stop-indicator having a finger interposed between said levers and the shipper, said indicator being mounted adjacent one of the levers, the position of the stop-indicator relative to said adjacent lever denoting which of said mechanisms has operated to stop the loom.

2. In a loom, a shipper, its notched holding-plate, means operative upon failure of a warp-thread to act directly upon and release the shipper, a stop-indicator adjacent said shipper and remaining in normal position when such direct movement of the shipper is effected, protector-mechanism, and weft-fork mechanism, individually operative to move the stop-indicator and through the mediation of the latter releasing the shipper, and a lever forming a part of one of said mechanisms, located adjacent the stop-indicator, the position of the latter relative to said lever indicating whether the protector or the weft-fork mechanism has operated to release the shipper.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JAMES H. NORTHROP.

Witnesses:
GEO. OTIS DRAPER,
ALBERT H. COUSINS.