

W. C. TROMBLY.
THIN PLACE DETECTING MECHANISM FOR LOOMS.
APPLICATION FILED NOV. 13, 1909.

959,654.

Patented May 31, 1910.

2 SHEETS—SHEET 1.

Fig. 1.

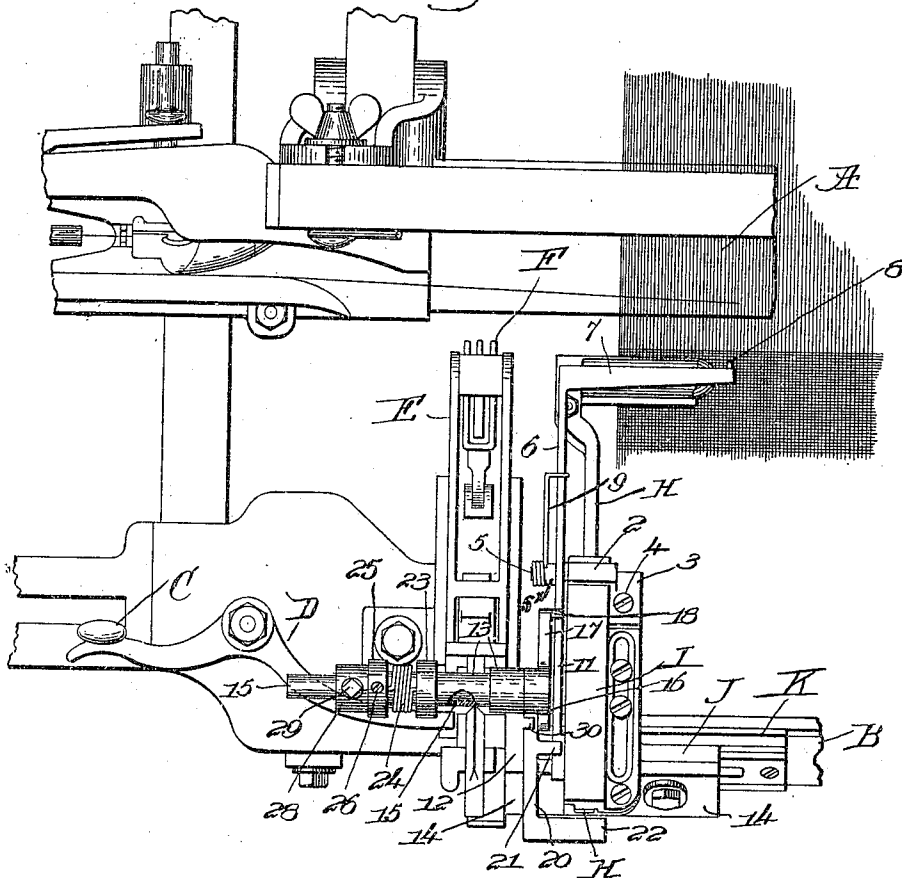
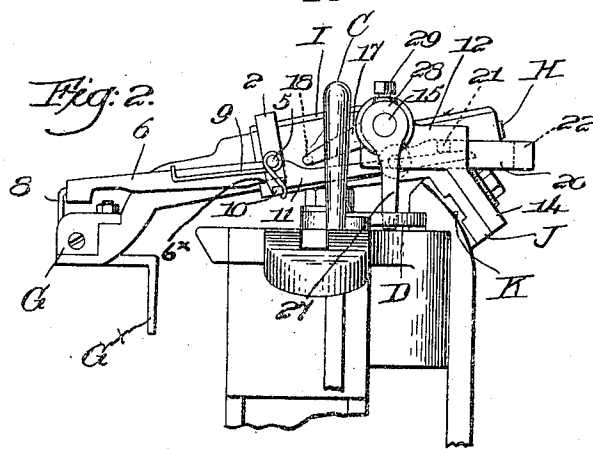


Fig. 2.



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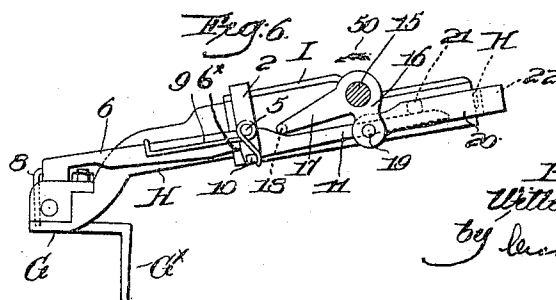
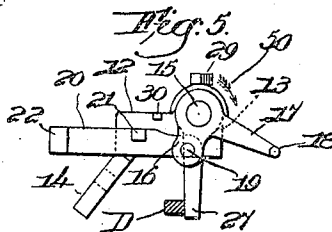
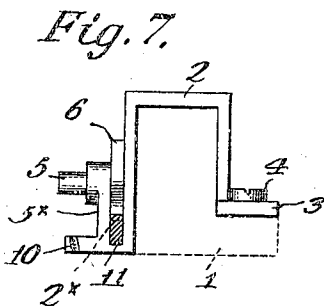
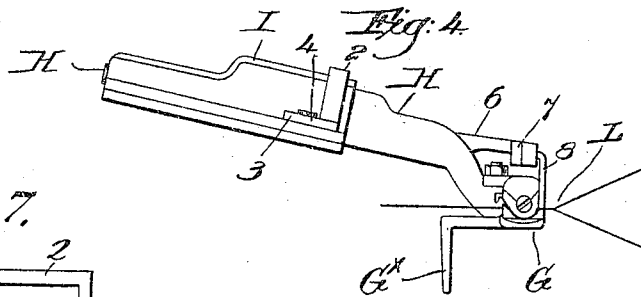
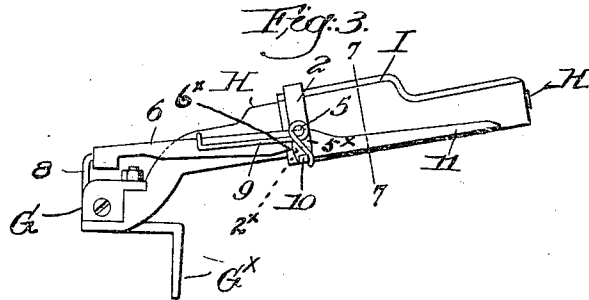
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

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THIN-PLACE-DETECTING MECHANISM FOR LOOMS.

959,654.

Specification of Letters Patent.

Patented May 31, 1910.

Application filed November 13, 1909. Serial No. 527,841.

To all whom it may concern:

Be it known that I, WILLIAM C. TROMBLY, a citizen of the United States, and resident of Lowell, county of Middlesex, State of Massachusetts, have invented an Improvement in Thin-Place-Detecting Mechanism for Looms, of which the following description, in connection with the accompanying drawing, is a specification, like characters on the drawing representing like parts.

This invention relates to mechanism for detecting thin places in cloth being woven on a loom and for effecting loom stoppage upon such detection, and my invention has for its object the production of thin-place detecting mechanism of novel and simple construction, the detector being mounted on the temple-stand, in the present embodiment of my invention, and I utilize the forward movement of the temple shank on the beat up of the lay to effect by novel means the release of the shipper.

The various novel features of my invention will be fully described in the subjoined specification and particularly pointed out in the following claims.

Figure 1 is a top plan view of a portion of a loom with one embodiment of my present invention applied thereto; Fig. 2 is a left hand side elevation of the thin-place detecting mechanism shown in Fig. 1, the filling-fork and its slide being omitted, however, for the sake of clearness; Fig. 3 is a left hand side elevation of the temple and temple-stand, with the detector mounted thereon, in normal position; Fig. 4 is a right hand side elevation of the parts shown in Fig. 3, to more clearly show the detector resting on the cloth adjacent the fell and the inner end of the temple; Fig. 5 is a right hand side elevation of the means whereby the forward movement of the temple shank is made operative to cause shipper release; Fig. 6 is a view similar to Fig. 1, but showing the detector in abnormal position, assumed when a thin place occurs, and with cooperating parts not illustrated in Fig. 3; Fig. 7 is an enlarged detail of the yoke carried by the temple stand, taken on the line 7-7, Fig. 3, and looking toward the left, the stand being indicated by dotted lines and the detector-carrier being shown in section.

Referring to Figs. 1 and 2 of the drawing the lay A, breast-beam B, shipper C, its pivoted knock-off lever D, operated at times by

forward movement of the slide E having the usual filling-fork F (Fig. 1), the temple G having its shank H slidably mounted to reciprocate in the stand I and moved rearward by a spring, (not shown) and the temple-stand bracket J laterally adjustable on a guide-plate K fixed on the breast-beam, may be and are all of usual or well known construction, the front end of the temple shank or bar H moving forward beyond the adjacent end of the stand I on the beat up of the lay, in a manner familiar to those skilled in the art.

In the present embodiment of my invention a yoke 2 is shaped to fit over and closely embrace the temple stand near its rear end, said yoke at its inner side having a slotted foot 3 adapted to rest upon the side flange of the stand, and the foot is clamped thereon by a clamp-screw 4, so that the yoke can be adjusted relatively to the temple toward or from the fell L of the cloth, Fig. 4, to thereby enable the detector to be positioned properly.

At its outer side the yoke has a lateral fulcrum seat 2*, Fig. 7, from which rises an upright extension 5* provided with an out-turned stud 5 and on the seat, between the extension 5* and the adjacent side of the yoke 2, is pivoted a detector-carrier comprising a rearwardly extended arm 6 turned laterally at its extremity at 7 and projecting above the temple G and having at its inner end a depending finger 8 which constitutes the detector, and which is adapted to rest upon the cloth adjacent the fell L and just beyond the inner end of the temple. The carrier and said detector rock on the seat 2* as a fulcrum the under edge of the carrier being cut out at 6* to fit the seat, and the detector is normally depressed and held upon the cloth by a light spring 9 coiled around the stud 5 and bearing at one end on the carrier, the other end of said spring being held fixed by a lug 10 on the outer end of the seat portion 2* of the yoke, see Figs. 3 and 7. The carrier has an extension 11 extended frontward alongside the temple stand, and when the cloth is intact the detector resting thereupon maintains said extension depressed and inoperative, as in Fig. 3. When a thin place occurs, however, the detector 8 descends through the cloth and the extension is raised to operative position, shown in Fig. 6, the rocking of the detector-carrier 6

and its extension 11 at such time being assisted by the spring 9.

A stand 12 having an elongated sleeve-like bearing 13 parallel to and above the breast-beam is provided with an ear 14 which is bolted to the temple-stand bracket J, at the outer side of and laterally separated from the temple-stand, as shown in Fig. 1, and in the bearing 13 is mounted a rock-shaft 15 extended laterally above and beyond the fork-slide E and the parts mounted thereon.

At the inner side of the bearing 13 the rock-shaft has fixed upon it a bell-crank 16, 17, the longer arm 17 extending rearward and having at its end a lateral lug 18 which extends across the top of the extension 11 but normally above and out of contact therewith, said arm operating as a retracting device, as will be explained, to retract the detector and lift it clear of the cloth after a thin place has been detected.

The short, depending arm 16 of the bell-crank has pivoted thereto at 19 a transmitting link or connector 20 extended forward and provided with an ear 21 which rests upon the extension 11, see Fig. 6, to control the position of the link vertically, the free end of the link or connector having a lateral head 22 which is moved into the path of the front end of the temple shank H when the link is operatively positioned, as in Fig. 6, to thereby operatively connect the temple shank, and the bell-crank and effect rotative movement of the rock shaft 15.

The bearing 13 near its outer end is annularly enlarged at 23, Fig. 1, and has secured to it one end of a spring 24 coiled around the outer end of the bearing, the other end of said spring being attached to a collar 25 fixed on the outer end of the rock-shaft 15 by a set-screw 26 at the outer end of the bearing 13.

An actuating dog 27 secured to or forming a part of a hub 28 adjustable on the shaft by a set-screw 29 depends from said hub back of the knock-off lever D and is held against it by the tension of the spring 24, the dog being swung forward to move the said lever D and thereby release the shipper C when the rock-shaft 15 is turned, as will be described.

As the stand 12 has its ear 14 bolted to the temple-stand bracket J any lateral adjustment of said bracket on the guide-plate K to properly position the temple with relation to the cloth will at the same time effect a corresponding adjustment of the stand 12 and the parts carried thereby. Said parts thus maintain a fixed relationship to the parts of the detecting mechanism mounted on the temple-stand, *i. e.*, the thin-place detector 8 and the detector-carrier 6 and its extension 11, irrespective of any lateral adjustment of the temple. Such adjustment, however, may at

times necessitate a change in the position of the hub 28 on the rock-shaft 15 in order that the dog 27 shall maintain its proper position with relation to the knock-off lever D, and such adjustment is effected through the set-screw 29, the hub 28 being moved in or out along the rock-shaft as may be necessary.

The assembled mechanism is shown in its normal position in Fig. 2, and at such time the detector 8 rests upon the cloth adjacent the fell L, Figs. 1 and 4, the extension 11 being depressed and out of engagement with the lug 18, while the head 22 of the link or connector 20 is positioned below and out of the path of movement of the front end of the temple shank H, the connector being held in such position by the ear 21 resting upon the extension 11 near its front end. This position of the connector 20, dog 27, and bell-crank 16, 17 is also shown in Fig. 5.

When a thin place in the cloth is detected by the detector 8 the latter, no longer sustained by the filling, descends through the warp threads, assisted by the action of the light spring 9, and as the carrier 6 rocks on its fulcrum-seat 2^x the extension 11 is elevated, acting through the ear 21 to swing the connector or link 20 upward on its pivot 19 and position the link-head 22 immediately in front of the temple shank H, as shown in Fig. 6, and at such time the extension 11 is moved up into engagement with the lug 18. The lay now beats up and by engagement with the usual heel G^x moves the temple G and its shank H forward, and said shank abuts against the head 22 and pulls the connector 20 forward with it, to rock the bell-crank 16, 17 and the rock-shaft 15 in the direction of the arrow 50, Figs. 5 and 6, the turning of the rock-shaft swinging the actuating dog 27 forward against the lever D, rocking the latter to release the shipper C and thereby effect loom stoppage through usual shipper-controlled devices, not shown.

When the bell-crank is rocked as has been described its longer arm 17 is depressed and thereby the lug 18 acts upon the extension 11 to depress it and swing upward the carrier 6, such movement of the carrier lifting the detector 8 automatically above and out of engagement with the cloth, to prevent any damage thereto should the cloth be let back, and also to prevent any engagement of the detector with some part of the lay.

After the fault in the cloth has been corrected the shipper is moved into running position to start the loom, and thereby the knock-off lever D is restored to the normal position shown in Figs. 1 and 2, said lever acting upon the dog 27 to turn back the rock-shaft 15 and the attached parts and set them in operative position. That is, the bell-crank arm 17 is raised to disengage its lug

18 from the extension 11, and the spring 9 depresses the carrier 6 slightly to position the detector upon the cloth, the extension 11 then being properly positioned to engage the ear 21 and sustain the connector 20 with its head 22 below the adjacent end of the temple shank H. Said connector is released by the usual spring-induced backward stroke of the temple shank as the lay recedes from front center after the beat up, and as the bell-crank is returned to its normal position its arm 16 draws back the connector to the position shown in Fig. 2. Thus by the movement of the shipper to running position the thin-place detecting mechanism is set automatically for further operation. When the knock-off lever D is swung forward by the dog 27 the spring 24 acts to continue the rotational movement of the rock-shaft 15 imparted to it through the forward pull of the link or connector 20, as described, and to prevent any undue rotation of said rock-shaft I provide the stand 12 with a stop-lug 30, to engage the rear end of the link above its pivot 19 when the bell-crank arm 16 is swung forward and upward. This stop-lug 30 also prevents any undue turning of the rock-shaft by the spring 24 when the stand 12 and the parts thereon are detached from the bracket J. So, too, if the lever D is operated by the fork-slide E to release the shipper, or if the shipper is thrown off manually, the spring 24 will act to turn the rock-shaft 15 as the dog 27 tends to follow the forward movement of the adjacent part of the lever D, the bell-crank 16, 17 turning with the rock-shaft, but rotation of the latter is limited by the stop-lug 30 so that the dog cannot swing clear of the lever D.

While I have herein illustrated for convenience loom stoppage as the change in the operation of the loom brought about by the operation of the thin-place detecting mechanism, other changes in the normal operation of the loom may be readily effected by the operation of such detecting mechanism.

My invention is not restricted to the precise construction and arrangement herein shown and described, for various changes or modifications may be made by those skilled in the art without departing from the spirit and scope of my invention as set forth in the annexed claims.

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

1. In a loom, a temple having a reciprocating shank, a thin-place detector, a shipper, releasing means therefor, and an actuating device comprising a rock-shaft and a dog carried thereby, and a connector pivotally attached to and to effect rotation of the rock-shaft, combined with means controlled by the detector to position the connector in

the path of and to be temporarily engaged and moved forward by the temple shank on its forward stroke, to turn the rock-shaft upon detection of a thin place in the cloth and effect the actuation of the shipper-releasing means by the dog.

2. In a loom, a temple having a reciprocating shank, a shipper, releasing means therefor, and a device to actuate said means, comprising a movable dog, and a connector operatively connected with and to effect movement of the dog, combined with a thin-place detector, and an instrumentality controlled thereby upon detection of a thin place in the cloth to effect temporarily cooperation between said connector and the front end of the temple shank, forward movement of the latter acting through the connector to move said dog to operate the shipper-releasing means.

3. In a loom, a temple-stand, a thin-place detector supported thereby, a temple having a shank to reciprocate in the stand, a shipper, its knock-off lever, and means to move it and effect shipper release, including a link having a head movable into the path of and to be engaged by the temple shank on its forward stroke, to draw the link forward and operate said means, combined with an instrumentality controlled by the detector to operatively position the link upon detection of a thin place in the cloth.

4. In a loom, in combination, a reciprocating temple and its shank, a shipper, a knock-off lever therefor, a rock-shaft having a dog to engage and actuate said lever, a connector pivotally and eccentrically connected with the rock-shaft, a thin-place detector, and an instrumentality rendered active by detection of a thin place in the cloth to effect temporarily cooperation of the connector and temple shank, and thereby turn the rock-shaft, movement of the dog actuating the knock-off lever to release the shipper.

5. In a loom, a temple-stand, a temple having a shank to reciprocate in the stand, a rocking carrier mounted on the temple-stand and having a front extension, a thin-place detector mounted on the carrier and normally resting upon the cloth, a shipper, and a knock-off lever therefor, combined with a fixed stand, a rock-shaft mounted thereon and having an attached dog to actuate the knock-off lever, a headed link pivotally and eccentrically connected with the rock-shaft and governed as to its position by the extension of the detector-carrier, and means operated by the rock-shaft to rock the carrier and retract the detector from the cloth after detecting action, downward movement of said detector upon detection of a thin place causing the carrier-extension to position the head of the link in front of

and to be moved by the temple shank on its forward stroke, to operatively turn the rock-shaft.

6. In thin-place detecting mechanism for looms, in combination, a reciprocating temple having a shank, its stand, a detector to normally rest upon the cloth adjacent the fell, a carrier for the detector, pivotally mounted on the temple-stand, and means temporarily engaged by the temple shank upon the forward stroke of the temple to positively engage and swing upward the carrier and thereby lift the detector from engagement with the cloth when the detector has detected a thin place therein.

7. In thin-place detecting mechanism for looms, in combination, a reciprocating temple, its stand, a detector to normally rest upon the cloth adjacent the fell, a yoke adjustably mounted on the temple-stand and having a lateral seat, a detector-carrier fulcrumed to rock on the seat of said yoke and having an extension in front of the seat, a spring to depress the carrier and maintain the detector upon the cloth, the extension at such time being elevated, and means to act upon and depress said extension to thereby raise the carrier against the action of said spring and lift the detector from engagement with the cloth when said detector has detected a thin place in the cloth.

8. In a loom, a shipper, a knock-off lever therefor, a temple-stand, a reciprocating temple having a shank slidable in said stand, a thin-place detector pivotally mounted on the temple-stand, a rock-shaft having an attached dog to engage and actuate the knock-off lever, a bearing for the rock-shaft, fixedly connected with the temple-stand, a connector eccentrically connected with the rock-shaft and adapted to be engaged and moved forward by the temple shank, to turn the rock-shaft, means governed by the detector upon detection thereby of a thin place in the cloth to effect engagement of the temple shank and connector, and a device operated by the rock-shaft when so turned to disengage automatically the detector from the cloth.

9. In a thin-place detecting mechanism for looms, a reciprocating temple and its shank, a stand in which the shank reciprocates, a seat laterally extended from the outer side of the stand, a detector-carrier fulcrumed to rock on said seat and having its rear end turned laterally above the temple and a thin-place detector depending therefrom and adapted normally to rest upon the cloth adjacent the fell near the inner end of the temple, said detector-carrier having an extension in front of the seat, combined with shipper-releasing means, and an instrumentality to actuate the same, said instrumentality including a swinging connector controlled and operatively positioned by the said extension of the detector-carrier, upon

detection of a thin place in the cloth, the connector when operatively positioned being temporarily engaged and moved by the front end of the temple shank in unison therewith on its forward stroke.

10. In thin-place detecting mechanism for looms, a reciprocating temple and its shank, a stand in which the shank reciprocates, a detector-carrier pivoted on the temple-stand and having its rear end turned laterally above the temple, a thin-place detector depending therefrom and adapted normally to rest upon the cloth adjacent the fell and near the inner end of the temple, shipper-releasing means, and an instrumentality to actuate the same, controlled and operatively positioned by the detector upon detection thereby of a thin place in the cloth and temporarily engaged and moved by the temple shank on its forward stroke, combined with means to positively act upon the detector-carrier and retract the detector automatically after its detecting action, said means being actuated by and simultaneously with the operation of said detector-controlled instrumentality.

11. In a loom, a reciprocating temple and its shank, a temple-stand in which the shank reciprocates, a carrier pivotally mounted on the temple-stand and having a detector to rest normally upon the cloth adjacent the fell, a frontward extension on the carrier, a device to effect a change in the normal operation of the loom, actuating means therefor including a rocking member and a connector movable with and also relatively to said member, said connector being normally held by the carrier-extension out of the path of the temple shank, descent of the detector when a thin place is detected rocking the carrier and acting through its extension to operatively position the connector, to be moved by the temple shank on its forward stroke and thereby operatively turn the rocking member of the actuating means, and a device to retract the detector from the cloth by or through such turning of said rocking member.

12. In a loom, a reciprocating temple and its shank, a thin-place detector normally resting on the cloth adjacent the fell, a shipper knock-off lever, a rock-shaft mounted above it, a depending dog adjustable on the rock-shaft and adapted to engage and operate said lever, means to turn the rock-shaft, including a member movable into the path of the temple shank when a thin place is detected, to be moved forward by the shank in unison therewith, an instrumentality governed by the detector to control the position of said member, and a device actuated by the rock-shaft when operatively turned to effect automatically disengagement of the detector from the cloth when a thin place therein has been detected.

13. In a loom, a temple-stand, a temple having a shank to reciprocate in the stand, a thin-place detector normally resting on the cloth adjacent the fell, a shipper knock-off lever, a transverse bearing above it and fixedly connected with the temple-stand, a rock-shaft in the bearing, a depending dog adjustable on the shaft, a spring acting through said shaft to retain the dog in engagement with said lever, means to operatively and positively turn the rock-shaft, including a member movable into the path of the temple shank when a thin place is detected, to be moved forward by and in unison with the temple shank, an instrumentality governed by the detector to control the position of said member, and a stop to limit spring-induced turning of the rock-shaft when the knock-off lever is moved into operative position.

14. In a loom, a thin-place detector, a shipper, a knock-off lever therefor, an actu-

ating device for said lever, including a rock-shaft and a dog thereon in engagement with said lever, a detector-carrier, an instrumentality governed thereby, when the detector detects a thin place in the cloth, to effect operative turning of the rock-shaft, and means actuated by such turning of the shaft to move the carrier and retract automatically the detector from engagement with the cloth, movement of the shipper to running position acting through the knock-off lever and the dog to restore automatically the rock-shaft, detector-carrier, and detector to normal position.

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

WILLIAM C. TROMBLY.

Witnesses:

G. L. BELL,
E. D. OSGOOD.