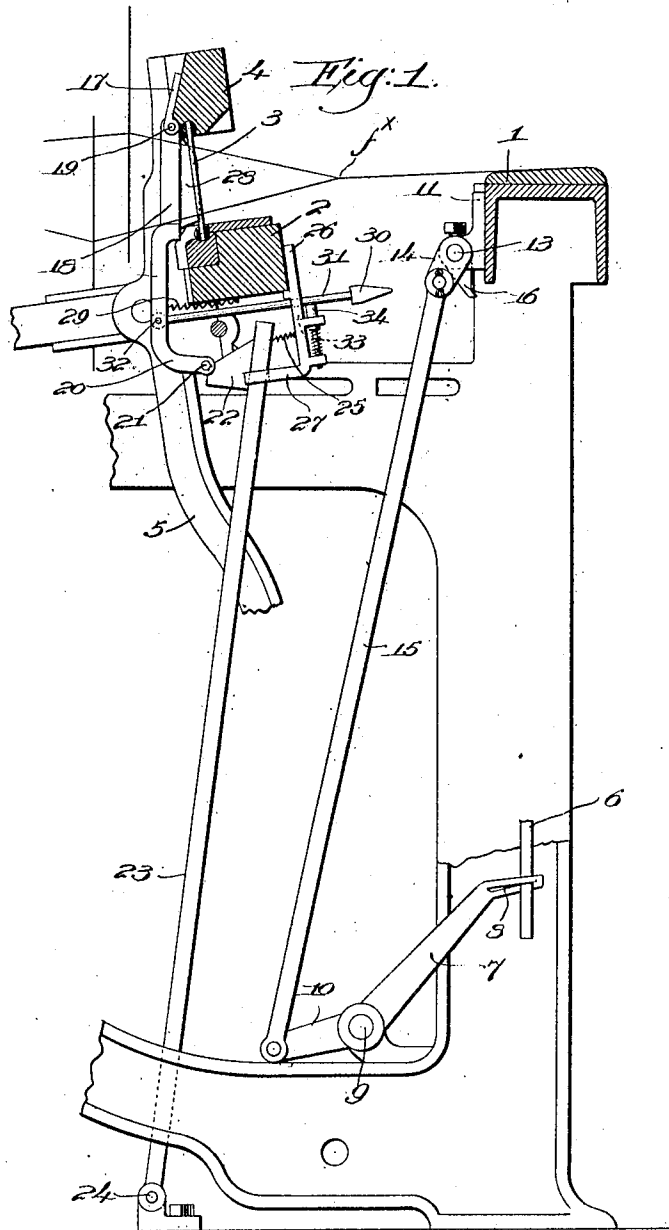


J. BELAVANCE.
THIN PLACE DETECTING MECHANISM FOR LOOMS.
APPLICATION FILED JULY 18, 1908.

918,645.

Patented Apr. 20, 1909.
2 SHEETS—SHEET 1.



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Fig. 2.

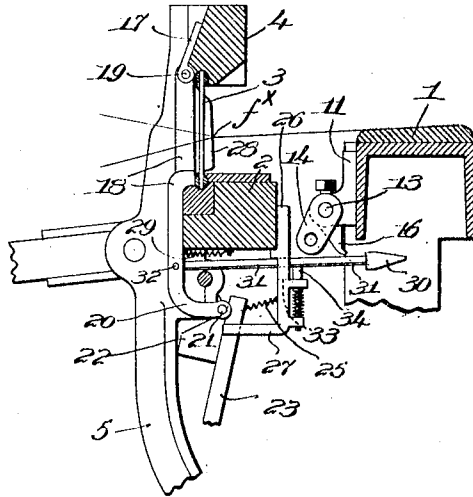


Fig. 4.

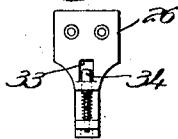


Fig. 3.

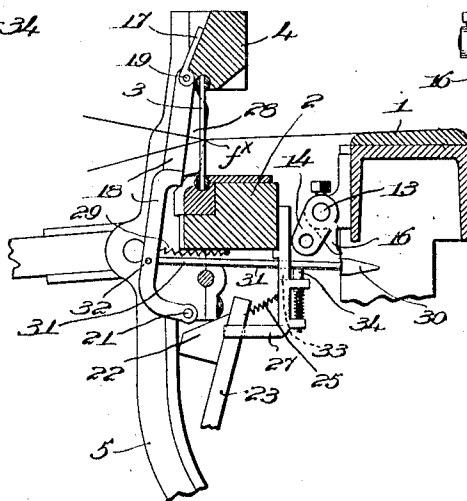
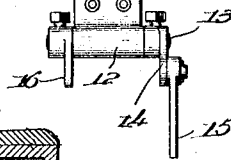


Fig. 5.



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UNITED STATES PATENT OFFICE.

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THIN-PLACE-DETECTING MECHANISM FOR LOOMS.

No. 918,845.

Specification of Letters Patent.

Patented April 20, 1909.

Application filed July 16, 1908. Serial No. 443,885.

To all whom it may concern:

Be it known that I, JOSEPH BELAVANCE, a citizen of the United States, and resident of Webster, county of Worcester, 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 numerals on the drawing representing like parts.

The absence of one or more picks of filling in the cloth being woven on a loom gives rise to a thin place or streak and damages the quality of the cloth, and various devices have been constructed to detect quickly the fault and effect loom stoppage promptly in order that the weaver may correct matters, the more promptly the thin place is detected the less work devolving upon the weaver in correcting the fault.

So far as I am aware the thin-place detectors heretofore proposed have included a detecting finger normally resting upon the cloth in advance of the fell, and as near thereto as possible, the finger dropping through the cloth when the thin place is reached and causing a change in the operation of the loom, such as stoppage thereof, by suitable mechanism.

In my present invention I mount the detector on the lay, said detector being in the nature of a loose reed, and so constructed and arranged that as the lay moves forward to beat in the filling the detector comes up against the fell. Should the filling be present it is detected by the detector and the normal operation of the loom continues, but if the filling is absent, thus giving rise to a thin place or streak, the absence is at once detected by the detector and an immediate change in the operation of the loom is effected. Herein I have arranged such change in operation to be a stoppage of the loom, so that the weaver can at once correct the fault and without undue labor.

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 partial transverse sectional view of a portion of a loom with thin-place detecting mechanism applied thereto embodying one form of my invention, the lay being in its backward position; Fig. 2 is a similar view, but with the lay so positioned

on its forward beat that the detector is just at the fell of the cloth and in readiness to detect; Fig. 3, a like view, shows the lay fully forward at front center, the filling being supposed to be present, in order to illustrate the normal action of the detector; Fig. 4 is a front elevation of the yielding support for the bunter the position of which is controlled by the thin-place detector; Fig. 5 is a rear elevation of a portion of the shipper-releasing means, to be referred to.

Referring to the drawings the breast-beam 1, lay 2 having a reed 3, reed-cap or hand-rail 4, lay-sword 5, shipper 6 only partly shown at the lower part of Fig. 1, knock-off arm 7 having a cam-slotted end 8 to coöperate with the shipper, the rock-shaft 9 on which said arm is fixed, and a second rearwardly extended arm 10 fast on said shaft, may be and are all substantially of usual construction and operate in usual manner.

A bracket 11 secured to the loom frame below and at the back of the breast-beam provides a horizontal bearing 12, Fig. 5, for a short rock-shaft 13 having depending from one end a short arm 14 pivotally connected by a link 15 with the arm 10, said link being omitted in Figs. 2 and 3. At the farther end the rock-shaft 13 has fixed to it a slightly hooked finger 16, normally positioned as shown in Figs. 1, 2 and 3 but when said finger is swung rearward the rock-shaft 13 will be turned to lift the link 15 and through arms 10 and 7 effect release of the shipper 6 from its usual holding-notch, not shown. The rearward movement of the finger is effected by or through the thin-place detecting device when a thin place is detected, as will be explained.

Upon a suitable plate 17, attached to the back of the hand-rail 4, preferably at the center of the reed, a depending carrier 18 is fulcrumed at 19, said carrier being bent suitably to coöperate with the back of the lay, the foot 20 of the carrier extending forward under the lay and having a lateral roller or other suitable stud 21 thereon. Said stud coöperates with a cam-like detent 22 mounted on a swinging support 23 having a fixed fulcrum 24, Fig. 1, and moved forward by a suitable spring, as 25, when the lay beats up, a depending bracket 26 on the lay having at its lower end a rearwardly extended, forked or slotted guide 27 for the upper end of the

support 23. When the lay moves back the carrier swings rearward away from the lay, as in Fig. 1, the stud 21 then abutting against the rear edge of the detent, the latter having been moved into the position shown by the backward movement of the lay. This causes the thin-place detector 28 to be retracted out of the shuttle path when the shuttle is picked, said detector being made as a thin and flat upright metal blade, fastened at its rear edge to the adjacent part of the carrier 18 and occupying the place of a reed-dent removed for the purpose. By reference to Fig. 1 it will be seen that when the detector is retracted its front or detecting edge is positioned within the reed face, the detector at such time to all intents taking the place of the dent which it displaces. Now as the lay moves forward after the pick to beat in the filling the stud 21 is disengaged by the stop 22, the latter moving out of the way of the stud, see Fig. 2, owing to the different fulcrum on which the lay and the stop-support 23 swing, so that the carrier 18 moves up against the back of the lay, as shown, and projects the front edge of the detector 28 forward beyond the reed to engage the fell f^* of the cloth before the lay reaches front center. The weight of the detector-carrier and its suspension on the lay may be utilized to effect this projection of the detector, shown in Fig. 2, or it may be assisted by a light spring 29, just strong enough to overcome inertia and friction, but not interfering with the retracting swing of the detector-carrier when the lay reaches back center. Now, viewing Fig. 2, if there is no thin place the filling will of course be present at the fell, and the projected detector will engage such filling and be held stationary thereby while the lay continues onward to front center, see Fig. 3, the reed beating in the filling. Thus the lay will be moved relatively to the detector and its carrier and the latter will be separated from the back of the lay, as in Fig. 3, to thereby depress the arrow-like bunter 30 below the tip of the finger 16, the shank 31 of the bunter being pivotally connected at 32 to the carrier. This bunter shank slides through a hole 33 in the bracket 26 and is yieldingly sustained on a spring-controlled support 34 carried by the bracket in front of the hole 33. When the bunter is moved downward into inoperative position, as described, through the detection of the presence of filling by the detector, the backward movement of the lay cannot cause the bunter and finger 16 to cooperate and the loom continues its normal operation. On the other hand, if there is a thin place and hence no filling at the fell when the parts are positioned as shown in Fig. 2, the detector-carrier will move forward with the lay as the latter reaches front center, but on the back stroke the bunter 30

will engage the finger 16 and rock the shaft 13, so that through the intervening connections the shipper will be released.

It should be stated that the spring-controlled support 34 normally holds the bunter-shank in such position that the bunter engages the tip of the finger 16 and is depressed thereby as it slides beneath the finger on the latter part of the forward beat of the lay. Referring to Fig. 2 it will be seen that the bunter has passed under and beyond the finger, and is positioned by the support 34 to cooperate with the finger on the next back stroke of the lay unless the detector inoperatively positions the bunter upon detection of the presence of filling at the fell. Viewing Fig. 3, as the lay moves back the bunter 30 is moved away from the finger 16, and as the reed retreats from the fell there is a relative movement of the detector and the lay whereby the detector-carrier 18 and the lay again assume substantially the relative positions shown in Fig. 2, before back center is reached, the detent 22 also moving back. When the lay reaches back center it stops momentarily as its movement is reversed, and the momentum of the detector-carrier swings it rearward, as in Fig. 1, so that the lug 21 brings up against the rear end of the detent on the forward stroke, to retain the detector retracted until the shuttle is picked. Thereafter the forward swing of the detent releases the lug and the detector is moved forward ahead of the reed, into detecting position, the bunter snapping under the finger 16, the operative positioning of the detector being assisted by the spring 29.

By arranging the detector as herein shown and described the detection of a thin place occurs practically as soon as it occurs, so that the change in the operation of the loom follows immediately.

My invention is not restricted to the precise construction and arrangement herein shown and described as the same may be varied or modified in different particulars by those skilled in the art without departing from the spirit and scope of my invention as set forth in the appended claims.

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

1. In a loom, a lay having a reed, a thin-place detector pivotally mounted on the lay above the reed and movable relatively thereto, adapted to engage the fell of the cloth in advance of the reed as the lay beats up, presence of filling in the cloth at the fell arresting the forward movement of the detector as the lay movement is completed, a thin place due to the absence of one or more picks of filling in the cloth permitting the detector to move forward with the lay, and means controlled by the detector to effect

stoppage or the loom when a unim place in the cloth is detected by said detector.

2. In a loom, a lay having a reed, a thin-
place detector movable with and also rela-
5 tively to the lay, to detect the presence or
absence of filling at the fell on the beat-up
of the lay, a swinging carrier pivotally
mounted on the lay above and back of the
reed and on which the detector is mounted,
10 means to swing the carrier forward on the
beat-up after the shuttle is picked, whereby
the detector is projected in advance of the
reed into detecting position, a device to en-
gage the carrier and temporarily hold it
15 back as the lay beats up, to retain the de-
tector out of the shuttle-path when the
shuttle is picked, and means to effect stop-
page of the loom by or through detection of
filling absence by said detector.

20 3. The combination, in a loom having a
lay and a reed thereon, of a detector mounted
on the lay and movable in advance of the
reed to detect at the time of beat up the
presence or absence at the fell of filling laid
25 on preceding picks, and means controlled by
said detector to effect stoppage of the loom
when said detector detects filling absence.

4. In a loom, a lay, a detector mounted
thereon to detect presence or absence of fill-
30 ing at the fell, means to maintain the de-
tector retracted behind the shuttle path when
the shuttle is picked, means to cause the de-
tector to move forward into detecting posi-
tion before the lay reaches front center, and
35 an instrumentality rendered operative to
effect stoppage of the loom when filling ab-
sence is detected by said detector.

5. In a loom, a lay having a reed, a filling
detector movable back and forth between
the reed dents, a carrier for said detector 40
fulcrumed on the lay above and back of the
reed, means to govern the movements of the
detector and project it beyond the reed after
the shuttle has been picked, to engage the
filling when present at the fell and be ar- 45
rested thereby before the lay reaches front
center, a bunter inoperatively positioned by
such arrest of the detector, and means, actu-
ated by the bunter when filling is absent, to
effect stoppage of the loom. 50

6. In a loom, a lay having a reed, a filling
detector movable back and forth between the
reed dents, a carrier for said detector ful-
crumed on the lay above and back of the 55
reed, means to govern the movements of the
detector and project it beyond the reed after
the shuttle has been picked, to engage the
filling when present at the fell and be ar-
rested thereby before the lay reaches front 60
center, a bunter yieldingly held in operative
position, means actuated by the bunter to
effect stoppage of the loom, and means gov-
erned by the detector to move the bunter
into inoperative position when the detector 65
is arrested by the presence of filling at the
fell.

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

JOSEPH BELAVANCE.

Witnesses:

TELESPHORE R. LEBOEUF,
J. C. ZÉPLIER-POTVIN.