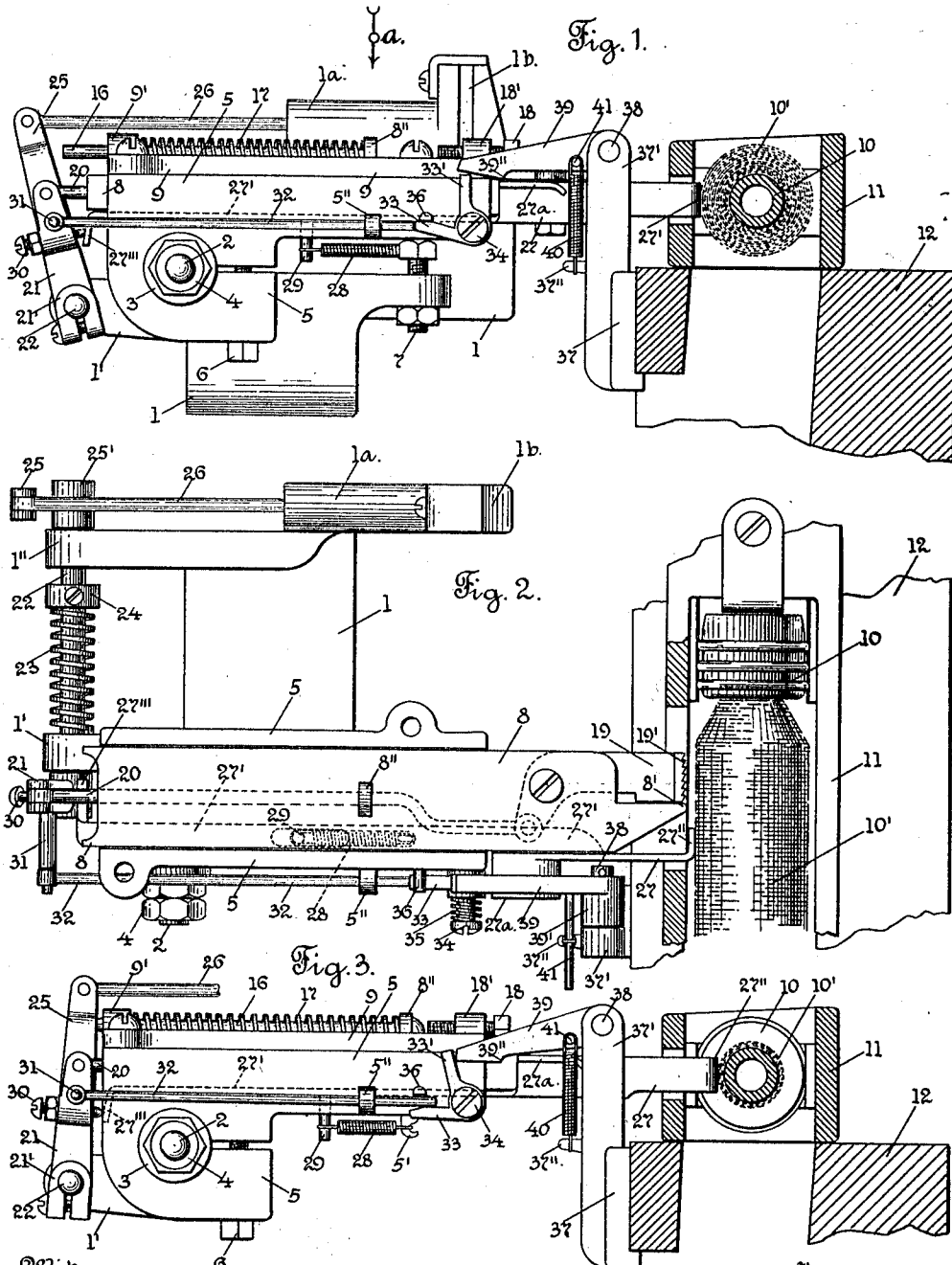


G. F. HUTCHINS.
LOCKING DEVICE FOR MECHANICAL FILLING DETECTORS.
APPLICATION FILED JAN. 12, 1911.

1,035,590.

Patented Aug. 13, 1912.

2 SHEETS—SHEET 1.



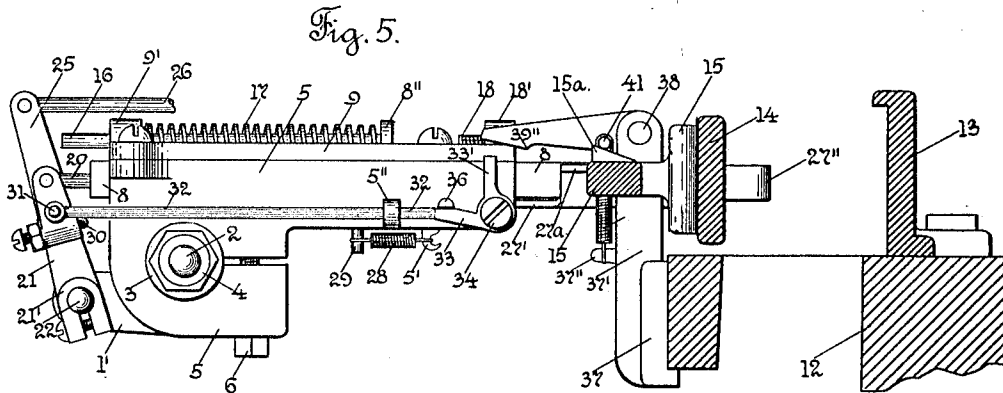
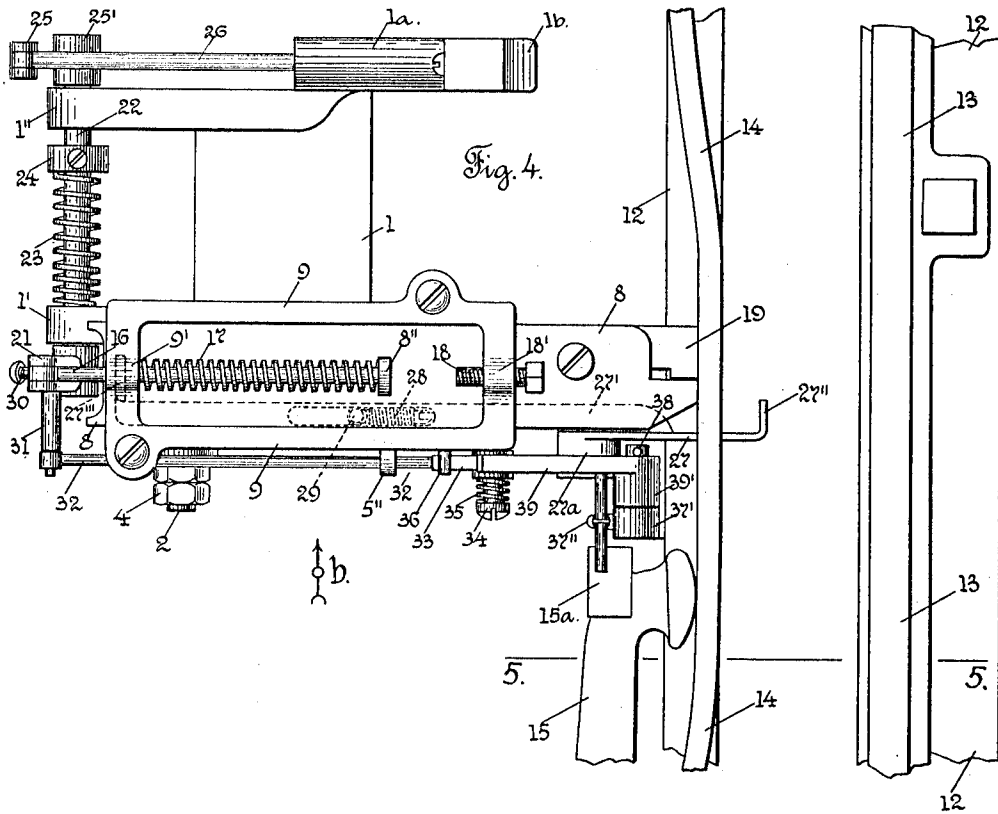
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2 SHEETS-SHEET 2.



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UNITED STATES PATENT OFFICE.

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LOCKING DEVICE FOR MECHANICAL FILLING-DETECTORS.

1,035,590.

Specification of Letters Patent.

Patented Aug. 13, 1912.

Application filed January 12, 1911. Serial No. 602,182.

To all whom it may concern:

Be it known that I, GEORGE F. HUTCHINS, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Locking Devices for Mechanical Filling-Detectors, of which the following is a specification.

My invention relates to a mechanical filling detector or feeler for weft replenishing looms, and more particularly to a feeler or filling detector of the type shown and described in U. S. Letters Patent, No. 972,722, in which a filling detector or feeler feels through an opening in the front wall of the shuttle to engage with the filling on the bobbin in the active shuttle on every other forward movement of the lay, and on the substantial or practical exhaustion of filling operates mechanism to cause the weft replenishing mechanism to supply a fresh bobbin, in the usual and well known way. Said filling detector or feeler comprises a feeler slide or member, which on every second forward movement of the lay is yieldingly held against the filling on the bobbin, and moves therewith a certain distance toward the front of the loom, as the lay beats up, to cause the pivot point of an operating lever of the weft replenishing mechanism to be withdrawn. A second member, which consists of an angle lever, is pivotally mounted on the first mentioned slide or member, and also engages the filling on the bobbin.

Until the substantial or practical exhaustion of filling on the bobbin is reached, said two members move in unison; upon the substantial or practical exhaustion of filling on the bobbin, there will not be a sufficient amount of filling on the bobbin to hold the engaged end of the second member or angle lever, and said member will rock or move on its pivotal support, and through a connection to a sliding rod or plunger, cause said plunger to move into its inoperative position, and act as a pivot point under-

neath an operating lever of the weft replenishing mechanism, to cause a bobbin to be dropped from its compartment to the discharging end of the magazine, all in the usual and well known way, and as described in the Letters Patent, No. 972,722, above referred to.

The type of the filling detector or feeler above referred to, feels for and engages the filling in the active shuttle every second pick, consequently there is a possibility of more or less injury to the filling on the bobbin where the feeler engages the filling, and wear of the moving parts of the feeler.

The object of my invention is to improve upon the construction of the filling detector or feeler above referred to, and more particularly to combine with said mechanism supplemental mechanism or means, to lock the feeler and hold it out of engagement with the filling on the bobbin until the filling has been substantially exhausted. When the filling on the bobbin is drawn off until the size of the bobbin has become sufficiently small, the feeler is automatically unlocked and moved forward to engage with the filling, in the usual way, to detect substantial or practical exhaustion of filling on the bobbin.

My invention consists in certain novel features of construction of my improvements as will be hereinafter fully described.

I have shown in the drawings a filling detector or feeler of the type above referred to, with my improvements combined therewith, sufficient to enable those skilled in the art, to understand the construction and operation thereof.

Referring to the drawings:—Figure 1 is a side view of the feeler mechanism with my improvements combined therewith; the lay beam, and a shuttle with a bobbin therein are shown in section. Fig. 2 is a plan view of the parts shown in Fig. 1, looking in the direction of arrow *a*, same figure. Fig. 3 shows some of the parts shown in Fig. 1, detached, and in a different position. Fig. 4 corresponds to Fig. 2, but

shows some of the parts of the stationary shuttle box on the lay, without a shuttle therein, and, Fig. 5 is a section, on line 5, 5, Fig. 4, looking in the direction of arrow b, same figure.

In the accompanying drawings, 1 is a stand secured to the loom side, not shown; a stud 2 on the stand 1 has a bushing 2 secured thereon by nuts 4, to adjustably receive the feeler bed or guide 5, which is clamped on the bushing 3 by a bolt 6, and rests at its front end on an adjusting bolt 7. The feeler bed 5 is preferably grooved on its upper portion to loosely receive the feeler slide 8, which is held thereon by a cap 9, (not shown in Fig. 2). The feeler slide 8, which is preferably made of sheet metal and hollow throughout its central portion, has the engaging end 8' to engage the filling 10' on the bobbin 10 in the active shuttle 11 carried on the lay 12.

13, see Figs. 4 and 5, is the rear wall of the stationary shuttle box, having a shuttle binder 14 in front, which is forced inwardly by a spring actuated lever 15 in the usual way.

A lug or extension 8'' on the slide 8, see Fig. 1, has a rod or wire 16 connected thereto, which extends through a lug 9' on the cap 9. A helically coiled expansion spring 17 encircles the rod 16, and acts to yieldingly move the feeler slide 8 toward the bobbin 10. An adjusting screw 18, turning in a threaded hole in a lug 18', limits the outward motion of the slide 8. An angle lever 19, which is pivotally mounted within the hollow part of the slide 8, is adapted to engage with its serrated or toothed end 19' on one arm, the filling 10' on the bobbin 10. The other arm of said angle lever 19 is pivotally connected to one end of a connector rod 20; the other end of said rod 20 is pivotally connected to the upper end of an upright lever 21, see Fig. 1, which has its hub 21' fast on a shaft 22, loosely mounted in bearings 1' and 1'' on the stand 1.

A helically coiled torsion spring 23 encircles the shaft 22, and has one end connected to the bearing 1', and its other end to a collar 24 secured on the shaft 22. The torsion spring 23 acts to cause the rocking of the shaft 22 and the movement of the lever 21 to operate the angle lever 19, when the slide 8, on the engagement with the bobbin, is moved toward the front of the loom. On the opposite end of the shaft 22 is secured the hub 25' of an upright lever 25; the upper end of said lever 25 is pivotally connected to the horizontally extending rod 26, which has its inner end loosely guided in a boss 1^a on the stand 1. The forward end of the rod 26 extends into an opening or slotted portion 1^b, and is adapted to form the pivot point of the end of an operating lever, not

shown, of the selecting mechanism of the magazine, not shown.

All of the above mentioned parts are of the usual and well known construction, and are particularly shown and described in the Letters Patent, No. 972,722, above referred to.

I will now describe my improvements.

I provide in this instance a third member or slide 27, preferably made of sheet metal, of the shape shown and which I term a feeler governor. The governor 27 is loosely guided on the feeler bed 5, having a side extension or flange 27' underneath the member or slide 8. The front portion of the governor 27 is bent, and has the engaging end 27'' adapted to slightly engage with the filling 10' on the bobbin 10, through the action of a helically coiled contraction spring 28. Said spring 28, see Fig. 3, has one end connected to a lug 5' on the feeler bed 5, and the other end to a pin 29, secured to the lower side of the flange 27' on the governor 27.

The opposite end of the governor 27 has a projection 27''', which is adapted to engage a set screw 30 on the upright lever 21, and by the engagement of the governor 27 with a filled bobbin 10 in the active shuttle, rock said lever 21 and moves it, and the feeler slide 8 connected thereto, to the position shown in Figs. 1 and 2.

The upright lever 21 has a stud 31 extending out therefrom, to which is pivotally connected the end of a horizontally extending rod 32. The rod 32 is loosely guided at 5'' on the feeler bed 5, and is adapted to engage with its end one arm of an angle lever 33, which holds the rod 32 and lever 21, and the feeler slide 8, in their inoperative positions, shown in Figs. 1 and 2. The lever 33 has its hub loosely mounted on a bolt 34. A helically coiled torsion spring 35 encircles the bolt 34, and acts to yieldingly move upwardly the arm 33 into the path of the rod 32. A lug 36 limits the upward movement of the arm 33. Extending upwardly from the hub of the lever 33 is a second arm 33', which is adapted to be engaged and operated by a bunter which is carried on the lay, to be hereinafter described.

The front of the lay beam 12 has a stand secured thereon, with an upwardly extending arm 37'; said arm 37' has a stud 38, on which is pivotally mounted the hub 39' of a forwardly extending bunter 39. A helically coiled contraction spring 40 has its lower end connected to a lug 37'' of the arm 37', and its upper end connected to a stud 41 on the bunter 39, and acts to yieldingly move downwardly said bunter 39. The governor 27 is provided with a projection 27^a, which is adapted, on the forward movement of the lay, to engage the lower edge 39'' of the bunter 39, to raise said bunter out of the

path of the arm 33'. The spring actuated lever 15, which as usual forces the shuttle binder 14 inwardly, as shown in Figs. 4 and 5, is provided in this instance with the wedge shaped projection 15^a. The projection 15^a is in the path of the extended stud or pin 41 on the bunter 39, and is adapted to raise said bunter 39 out of the path of the arm 33' when the shuttle binder 14 is moved inwardly, in case the stationary shuttle box is vacant, as shown.

From the above description in connection with the drawings, the operation of my improvements will be readily understood by those skilled in the art and briefly is as follows:—

A filled bobbin 10, as shown in Fig. 1, will, on the forward movement of the lay 12, engage the end 27'' of the governor 27, and move said governor outwardly or toward the front of the loom, and through the engagement of the projection 27''' on the governor 27, with the set screw 30 on the lever 21, will move outwardly said lever 21, and through the rod 20, connected with the feeler slide 8 will move said slide 8 outwardly and out of engagement with the filling 10' on the bobbin 10, as shown in Fig. 2. The rod 32 will be moved outwardly with the lever 21, so that its inner end will pass by the end of the arm 33, and allow the spring 35 to act; to move upwardly said arm, to bring the end thereof back of the rod 32, as shown in Fig. 1, to hold, through rod 32, the lever 21 in its outward position, and the slide 8 in its outward or inoperative position, and out of reach of the bobbin on the forward movement of the lay. As long as there is a sufficient amount of filling 10' on the bobbins, the projection 27^a on the governor 27 remains in the path of the lower edge of the bunter 39, and holds the bunter 39 in its raised position, when the lay moves toward the front of the loom, as shown in Fig. 1. The diminished amount of filling 10' on the bobbin 10, as shown in Fig. 3, will not move the governor 27 far enough, and the bunter 39 drops from the projection 27^a, and moves into the path of the arm 33' to operate said arm, and moves the arm 33' downwardly, and out of engagement with the rod 32, to unlock the lever 21 and the feeler slide 8, to allow said feeler slide 8 to move into its operative position, to detect the practical or substantial exhaustion of filling on the bobbin, in the usual and well known way, and as shown in Fig. 3.

When the active shuttle is on the opposite end of the lay, and the stationary shuttle box is vacant, the shuttle binder 14, as shown in Figs. 4 and 5, is moved inwardly by the spring actuated lever 15, and the wedge shaped projection 15' thereon, causes, through the stud 41, the bunter 39 to be

raised, to prevent it from unlocking the feeler on the forward movement of the lay, as shown in Fig. 5.

It will be understood that the details of construction of my improvements may be varied if desired.

The advantages of my improvements will be readily understood by those skilled in the art.

By means of a feeler governor, so-termed, which in this instance consists of the slide 27 having a reciprocating movement, and engaging lightly with the filling on the bobbin every second pick, on the forward movement of the lay, and intermediate connections to the ordinary filling detecting mechanism, comprising in this instance a reciprocating slide having two feeler members thereon, both of said feeler members are retained in an inoperative position, thus preventing the liability of injury to the filling by the constant engagement of the filling detector or feeler therewith, and the necessary wear of the moving parts of the feeler mechanism.

In my improvements, the moving parts of the feeler mechanism are normally inoperative, and remain stationary until the filling on the active shuttle is partially depleted; the filling feeler mechanism is then allowed to operate, to detect the exhaustion, or substantial exhaustion of the filling, and put into operation the transfer mechanism in the ordinary way.

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

1. In a filling detector mechanism for weft replenishing looms, the combination with a feeler to enter an opening in a shuttle, and to detect the condition of the filling on the bobbin therein, of means to move and hold said feeler out of contact with the filling on the bobbin, and means, dependent on the active shuttle, and the operation of said means controlled by the filling on the bobbin in said active shuttle, to release said feeler, and allow it to contact with the filling in the active shuttle, when the filling is substantially exhausted.

2. In a filling detector mechanism for weft replenishing looms, the combination with a feeler, comprising two members to move in unison and enter an opening through the shuttle, to engage the filling on the bobbin therein, of means to move and hold said feeler out of contact with the filling on the bobbin, and means, dependent on the active shuttle, and the operation of said means controlled by the filling on the bobbin in the active shuttle, to release said feeler, and allow it to contact with the filling in the active shuttle, when the filling is substantially exhausted.

3. In a filling detector mechanism for weft replenishing looms, a feeler, to feel through an opening in the shuttle, and having a plurality of members to contact with the filling in the shuttle, means to render two of said members inoperative, and means, controlled by the third member of the feeler mechanism, to automatically release the first mentioned two members, when the filling has been partially exhausted, to allow them to move into operative position.

4. In a filling detector mechanism for weft replenishing looms, a feeler having two members to contact with the filling in a shuttle, means to hold one of said members out of contact with the filling, and means, located on the lay and controlled by the other member, to automatically release the first mentioned member when the filling has been partially exhausted.

5. In a filling detector mechanism for

weft replenishing looms, a feeler having three members to contact with the filling in the shuttle, means to render two of said members inoperative, and means located on the lay and controlled by the third member, to automatically render said first mentioned two members operative when the filling has been partially exhausted.

6. In a filling detector mechanism for weft replenishing looms, a feeler mechanism having a plurality of members to contact with the filling in a shuttle, means to hold one of said members out of contact with the filling, and means, controlled by another member, to automatically release the first mentioned member, when the filling has been substantially exhausted.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents. Washington, D. C."
