

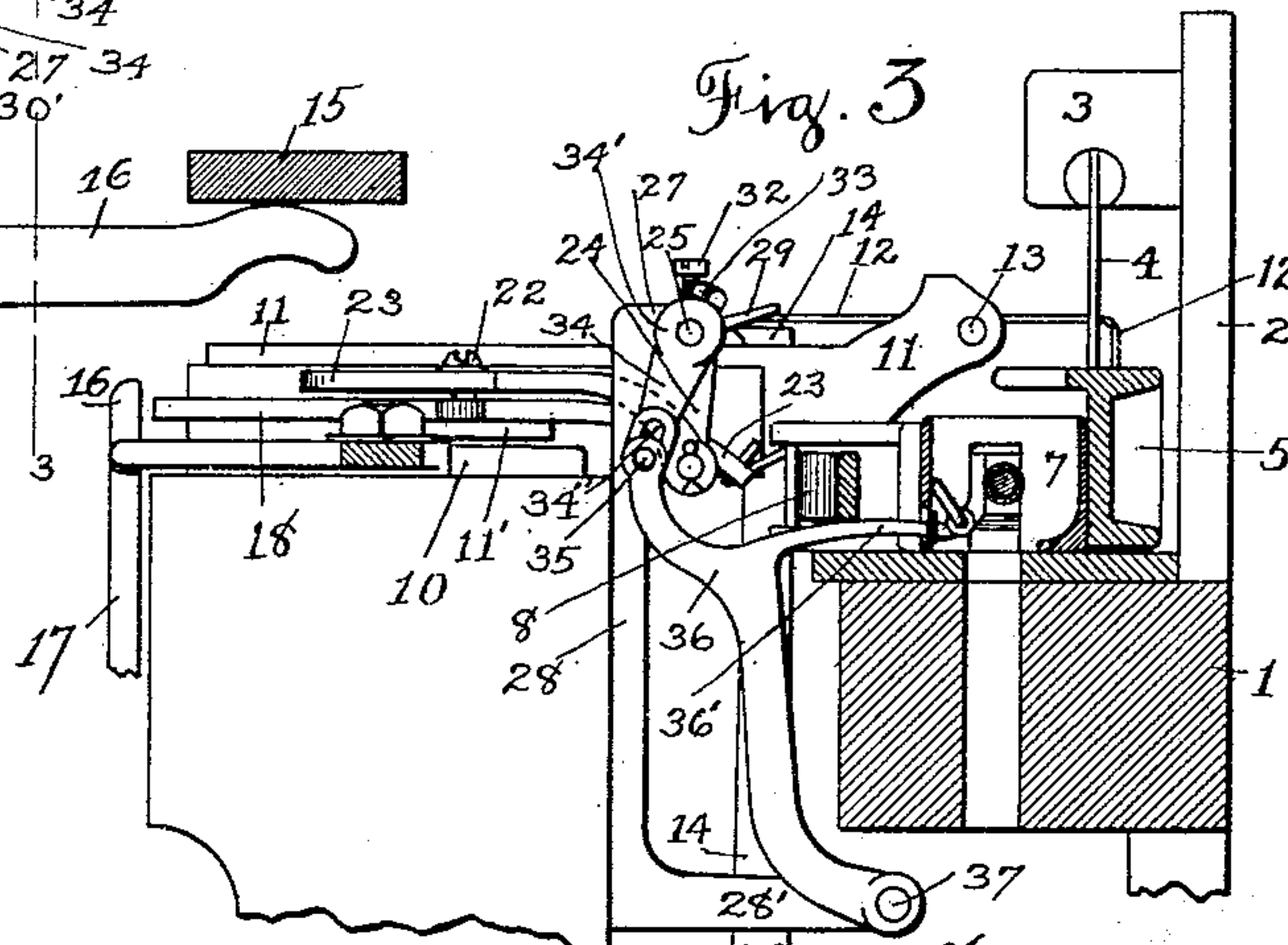
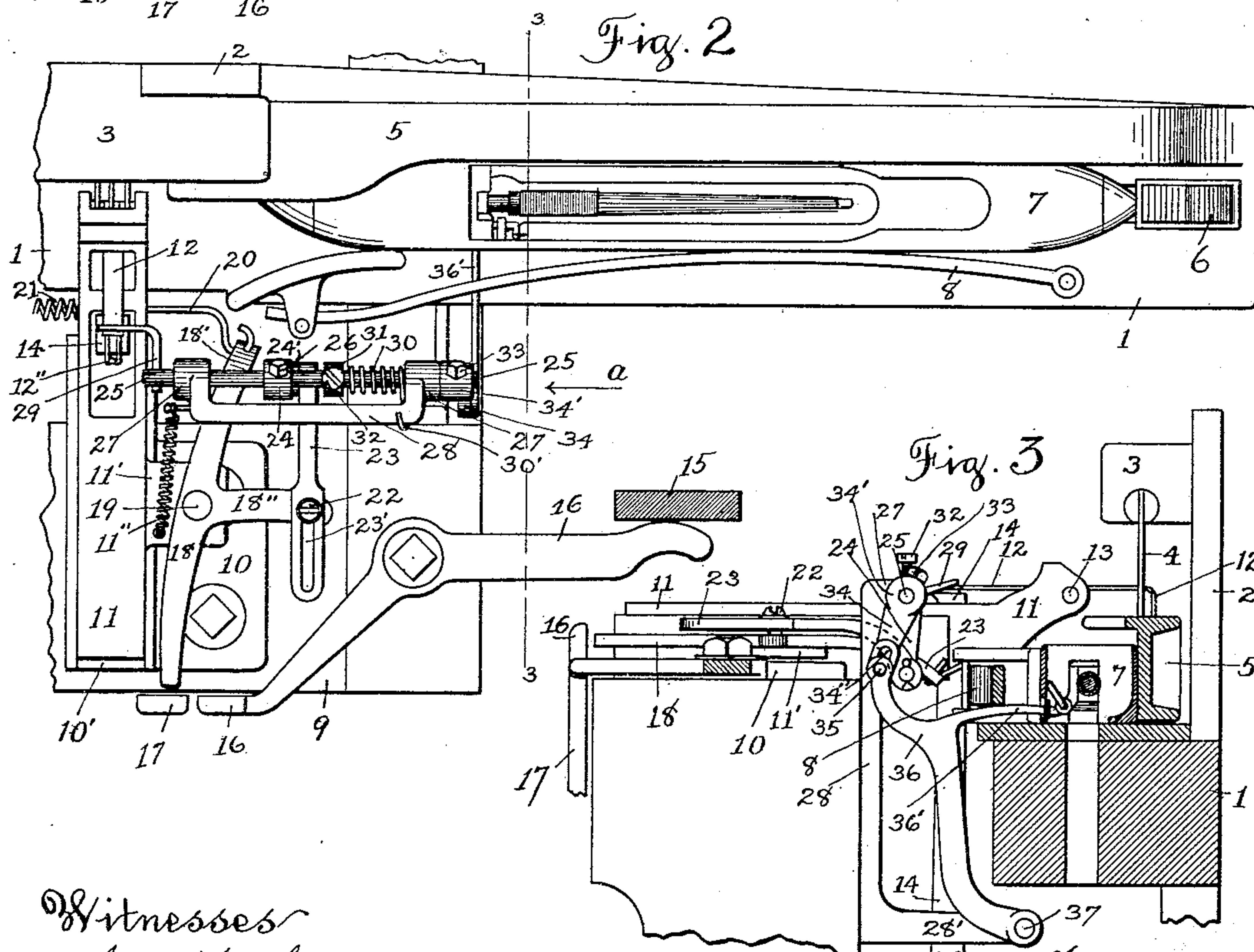
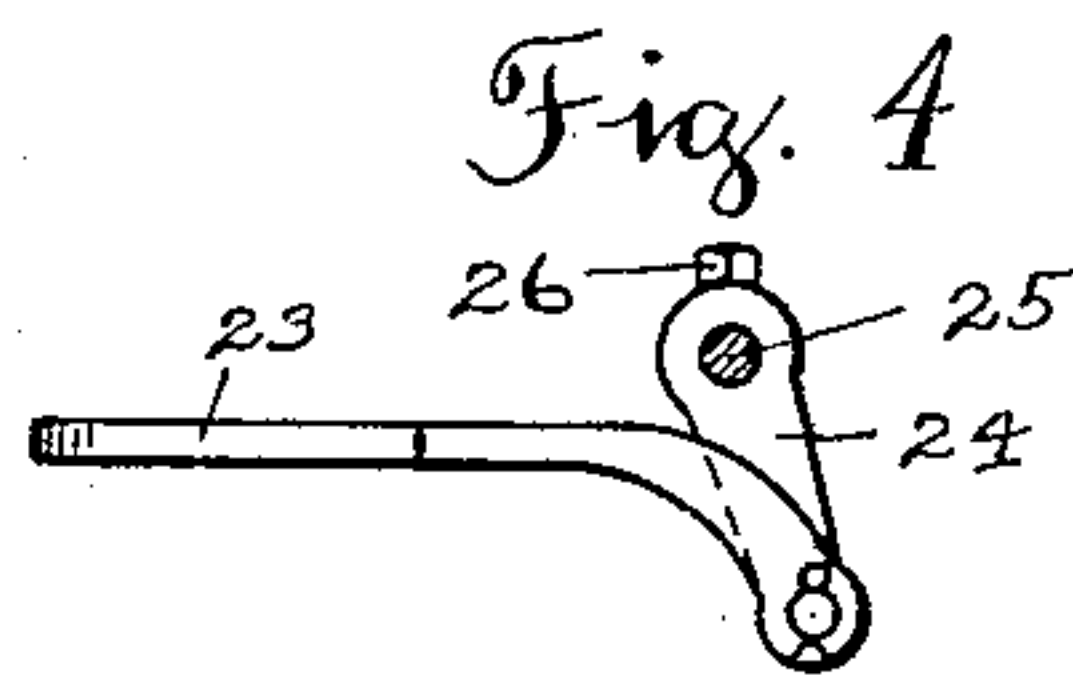
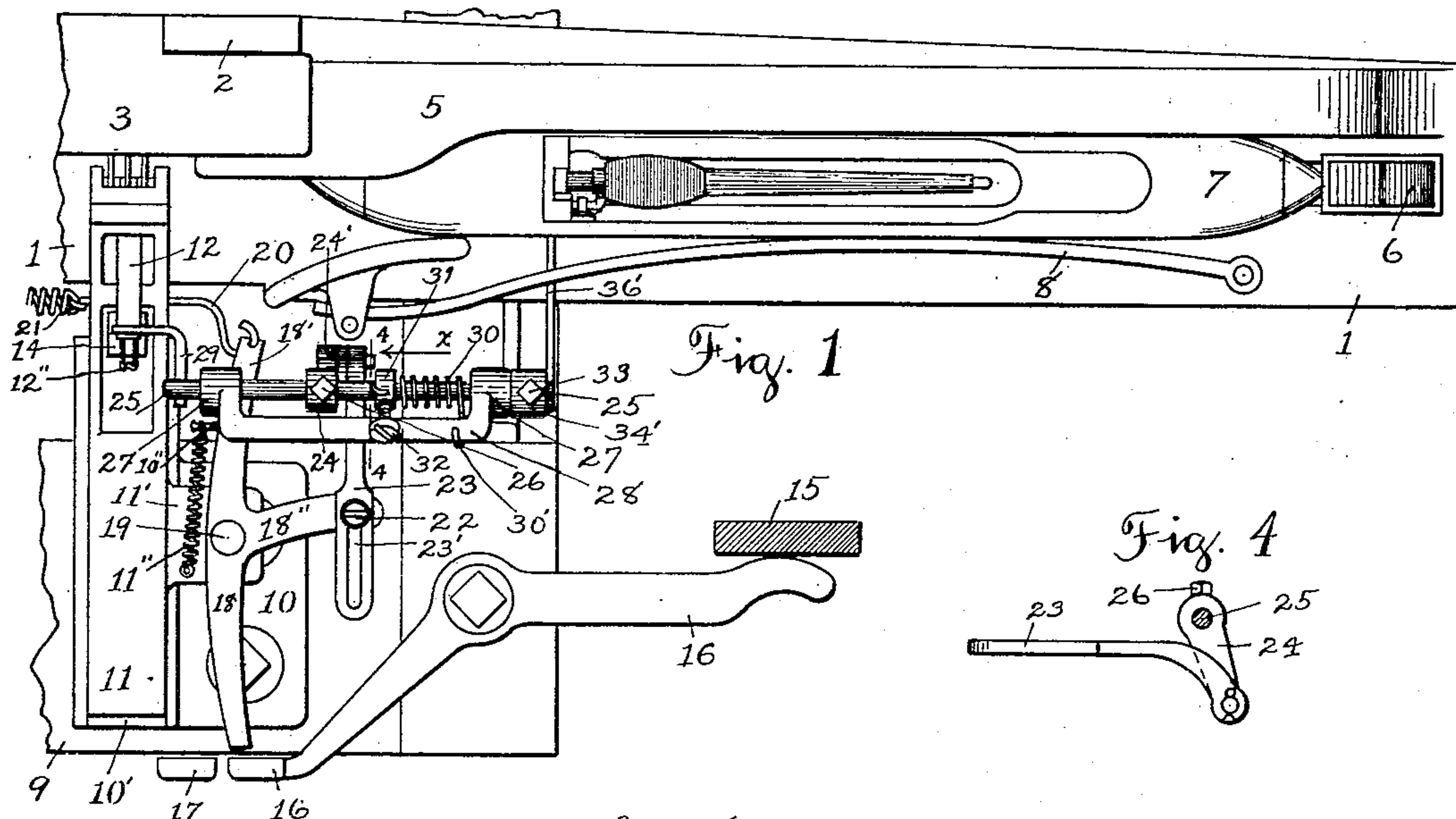
G. F. HUTCHINS.

FILLING REPLENISHING MECHANISM FOR LOOMS.

(Application filed Oct. 31, 1901.)

(No Model.)

2 Sheets—Sheet 1.



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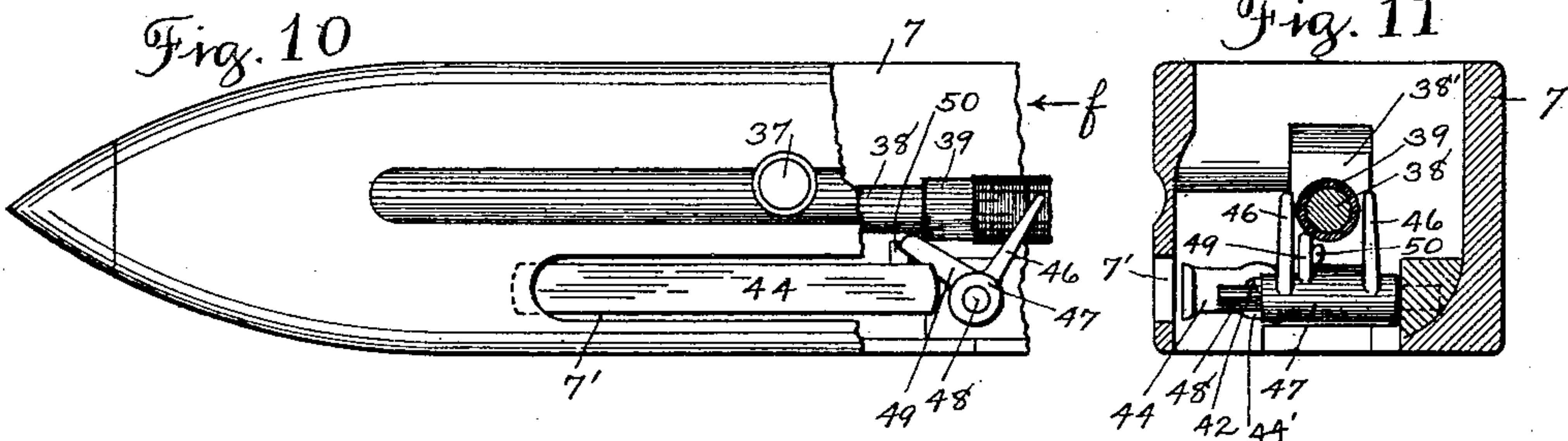
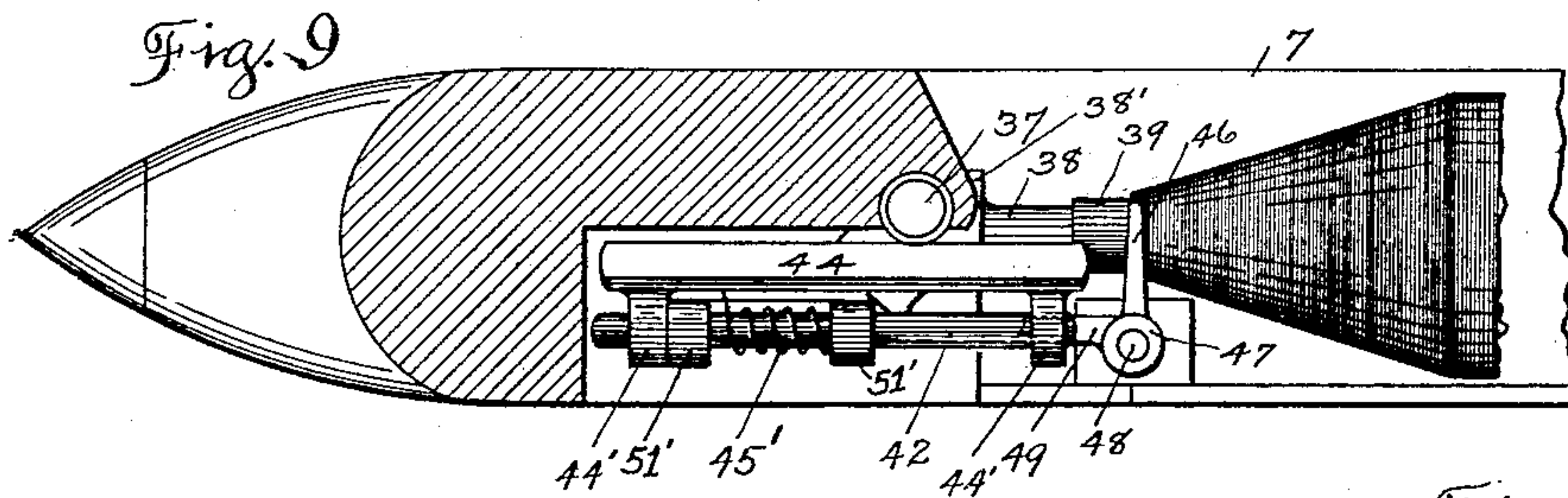
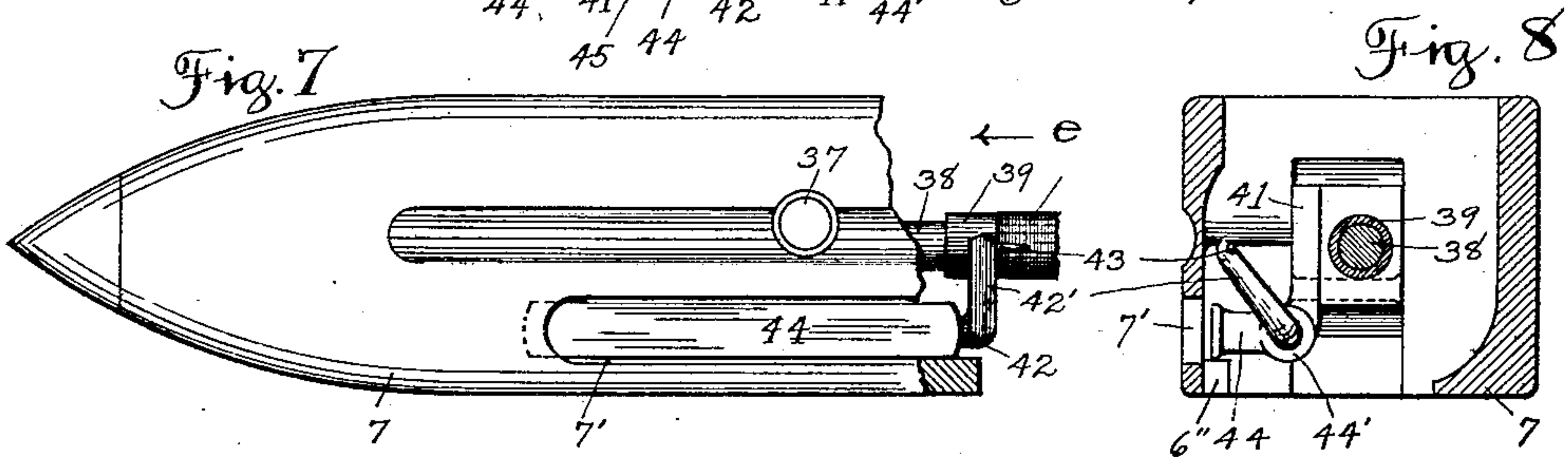
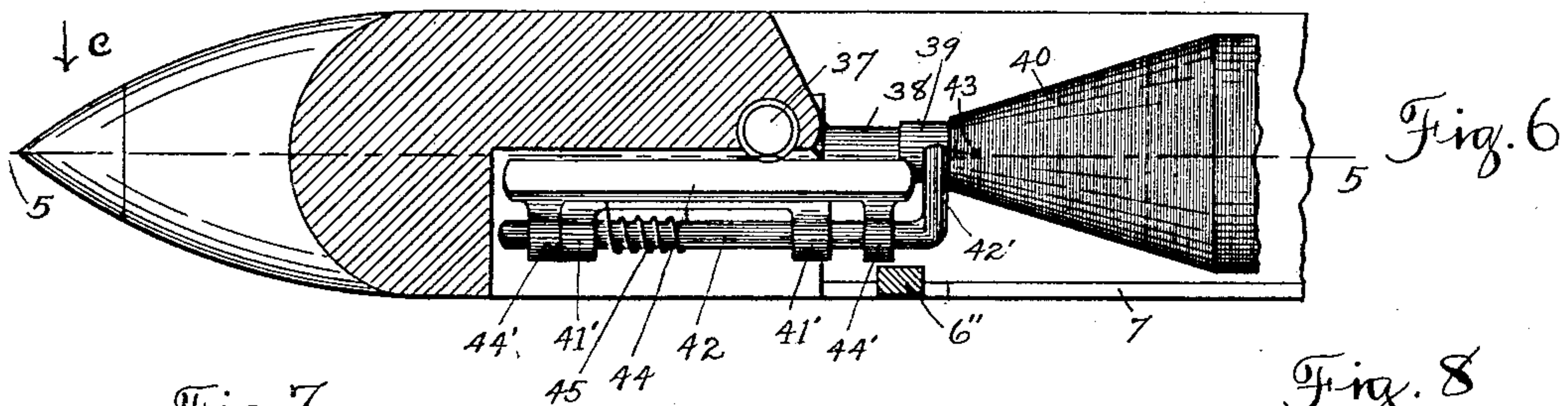
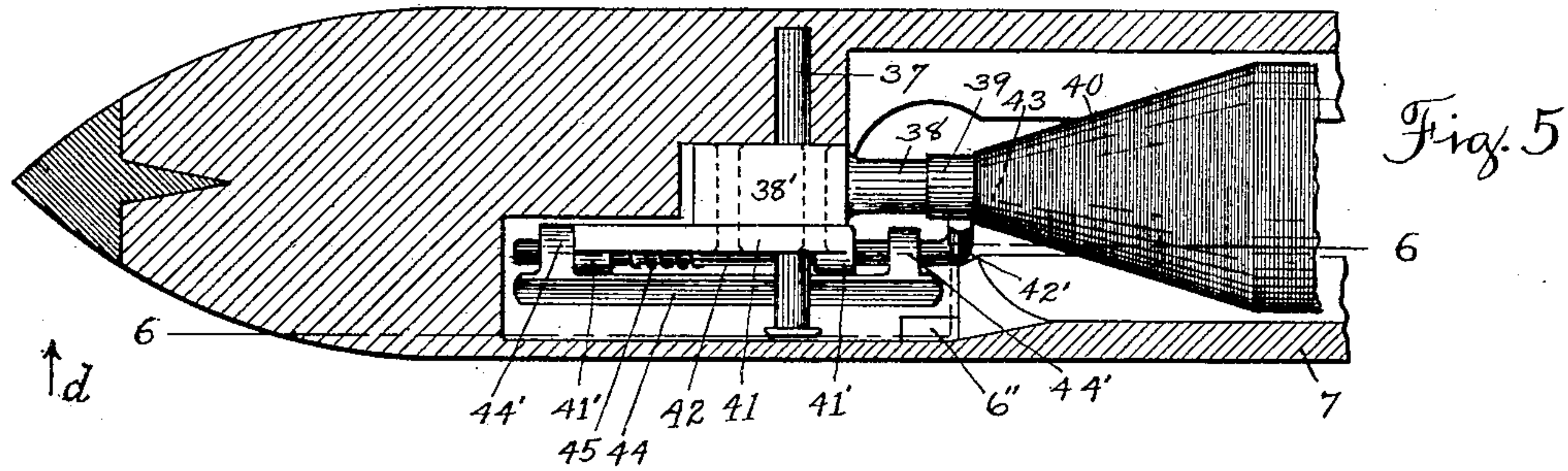
G. F. HUTCHINS.

FILLING REPLENISHING MECHANISM FOR LOOMS.

(Application filed Oct. 31, 1901.)

(No Model.)

2 Sheets—Sheet 2.



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UNITED STATES PATENT OFFICE.

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FILLING-REPLENISHING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 702,876, dated June 17, 1902.

Application filed October 31, 1901. Serial No. 80,654. (No model.)

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 Filling-Replenishing Mechanism for Looms, of which the following is a specification.

My invention relates to looms, and particularly to that class of looms which have a filling or shuttle changing mechanism and a filling-detector mechanism automatically indicating for a fresh supply of filling when the filling in the running shuttle is substantially exhausted.

The object of my invention is to improve upon the construction of looms of the class above referred to, and more particularly to provide a filling-detector mechanism and mechanism intermediate the filling-detector mechanism and the ordinary filling stop mechanism of a loom, so that the filling stop mechanism or the filling-detector mechanism will automatically act at the proper time either to stop the loom or effect a change of filling.

In the ordinary construction of the filling-detector and filling-changing mechanism in the class of looms above referred to the loom runs continuously and the filling-changing mechanism will be automatically operated to change the filling when the filling breaks, as well as when the filling is substantially exhausted in the running shuttle. In order to weave perfect goods, it is necessary to stop the loom when the filling breaks and weave in a full thread in place of the broken thread extending part way across the fabric.

By my improvements the ordinary filling stop-motion of a loom operates to automatically stop the loom in case of the breaking of filling in the running shuttle, and the ordinary filling-changing mechanism operates automatically to change the filling upon indication by the filling-detector mechanism of substantial exhaustion of filling in the running shuttle.

In my improvements I provide a lever connected to and moving with the ordinary filling-fork slide, the normal position of which lever is such that in case of the breaking of

filling in the running shuttle said lever will automatically operate the knock-off lever or other mechanism to stop the loom, and in case of substantial exhaustion of filling in the running shuttle the same lever, automatically moved by the filling-detector mechanism, will operate the filling-changing mechanism to change the filling in the shuttle or change the shuttle carrying the filling. After the filling or the shuttle carrying the filling is changed the lever above referred to will be automatically moved to its first position to again operate the filling stop mechanism in case of breakage of filling or the filling-changing mechanism on substantial exhaustion of filling.

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

Referring to the drawings, Figure 1 is a plan view of a portion of a loom, showing one end of the lay, the shuttle-box with a shuttle therein, one end of the breast-beam, the knock-off lever, the shipper-lever, and my improvements. The parts are shown in their normal positions. Fig. 2 corresponds to Fig. 1, but shows the lever on the filling-fork slide and some of the other parts in their opposite positions. Fig. 3 is a cross-section on line 3 3, Fig. 2, looking in the direction of arrow *a*, same figure. Fig. 4 is a sectional detail taken at a point indicated by line 4 4, Fig. 1, looking in the direction of arrow *x*, same figure. Fig. 5 is a sectional plan view of one end of a shuttle, taken at a point indicated by line 5 5, Fig. 6, looking in the direction of arrow *c*, same figure, and showing my filling-detector mechanism, which may be used with the mechanism shown in Figs. 1, 2, and 3. The spindle and filling are shown in full. Fig. 6 is a sectional view of the end of the shuttle shown in Fig. 5, taken at a point indicated by line 6 6, Fig. 5, looking in the direction of arrow *d*, same figure. The filling is shown in full. Fig. 7 is a side view of the end of the shuttle shown in Fig. 6, showing the latch closed and the filling drawn off the cop. Fig. 8 is an end view of the parts shown in Fig. 7, looking in the direction of arrow *e*, same figure. Fig. 9 corresponds to Fig. 6, but shows a modified

construction of the latch mechanism. Fig. 10 corresponds to Fig. 7, but shows the modified construction of the latch mechanism shown in Fig. 9; and Fig. 11 is an end view of the parts shown in Fig. 10.

In the accompanying drawings, in Figs. 1, 2, and 3, 1 is the lay; 2, the upper portion of the lay-sword; 3, the hand-rail; 4, the reed; 5, the shuttle-box; 6, the upper end of the picker-stick; 7, the shuttle; 8, the shuttle-binder spring; 9, the breast-beam; 10, a stand secured on the top of the breast-beam and having a way 10' therein for the filling-fork slide 11, carrying the filling-fork 12, pivoted on a pin 13 and having the downwardly-projecting prongs 12' at its inner end and the hook 12'' at its outer end to engage the upper end of the cam-lever 14 when the prongs 12' on the filling-fork 12 are not engaged by the filling to tilt the fork and move the hook end 12'' out of engagement with the cam-lever 14. A spring 11'', attached to the slide 11 and to a stationary pin 10'', acts to move the slide 11 forward or return it to its normal position. 15 is the shipper-lever, 16 the knock-off lever, 17 an arm fast on a rock-shaft, not shown, the rotation of which puts into operation the filling-changing mechanism in the ordinary and well-known way.

All of the above parts may be of the ordinary and well-known construction and operation in the class of looms above referred to.

I will now describe my improvements combined with the parts above described.

I will first describe the mechanism intermediate the filling-fork and the filling-detector mechanism in the shuttle and which is shown in Figs. 1, 2, and 3.

The filling-detector mechanism in the shuttle may be of any ordinary and well-known construction.

I have shown in the drawings, Figs. 5 to 11, inclusive, forms of filling-detector mechanisms of my invention which may be used and which consist of a movable latch which will be instantly moved to close an opening in the shuttle and prevent the entrance of a lever or other device on substantial exhaustion of filling.

Referring to Figs. 1, 2, and 3, 18 is a lever, pivoted at 19 on a side extension 11' on the filling-fork slide 11. The lever 18 has a pivotal motion in a horizontal plane and in its normal position is adapted to engage at its rear end in this instance the knock-off lever 16, as shown in Fig. 1, on the backward movement of the filling-fork slide 11 in case of absence of filling and operate the knock-off lever 16 and the shipper-lever 15 and stop the loom in the ordinary way. The lever 18 in its opposite position (see Fig. 2) is adapted to engage at its rear end in this instance the upwardly-extending arm 17 on the backward movement of the filling-fork slide 11, to move said arm and rock the shaft (not shown) on which it is fast, and put into operation the filling-changing mechanism (not shown) in

the ordinary way on substantial exhaustion of filling in the running shuttle. The lever 18 at its forward end 18' is curved downwardly and has secured thereto one end of a wire or connector 20. The wire 20 extends under the filling-fork slide 11 and back of and parallel to the breast-beam 9. A coil-spring 21 is secured at one end to the wire 20 and at its other end (not shown) to a stationary part of the loom. The spring 21 acts to automatically move the lever 18 from the position shown in Fig. 2 to the position shown in Fig. 1. Extending out from one side of the lever 18 is an arm or extension 18'', in the outer end of which is a screw 22, which extends loosely through an elongated slot 23' in a lever 23 and engages the inner end of said slot. The forward end of the lever 23 is curved downwardly and pivotally attached to an arm 24, having a hub 24' thereon and fast on a shaft 25, secured thereto by a set-screw 26. The shaft 25 is mounted to rotate or have a rocking motion in bearings 27 on a stand 28, secured to the breast-beam 9. A curved pin 29 is fast in the inner end of the shaft 25 and extends over the hooked end 12'' of the filling-fork 12, as shown. A spiral spring 30 encircles the shaft 25 and is secured at one end 30' to a stationary part and at its other end to a collar 31, secured on the shaft 25 by a set-screw 32. The spiral spring 30 acts to rock the shaft 25 and hold the pin 29 out of engagement with the forked end 12'' of the filling-fork 12, as shown in Fig. 1. On the outer end of the shaft 25 is secured by a set-screw 33 the hub 34' of an arm 34. The lower end of the arm 34 has a slot 34'' therein, into which extends a pin 35 on the upper end of a lever 36, pivoted at its lower end on a pin 37 on an extension 28' on the stand 28, as shown in Fig. 3. The lever 36 has the forwardly-projecting portion 36', which is adapted on the beating up of the lay to enter an aperture or opening in the shuttle when said aperture or opening is not closed by the operation of the filling-detector mechanism contained in or on the shuttle on substantial exhaustion of filling, as will be hereinafter described. In case the extension 36' on the lever 36 is free to enter the aperture in the shuttle the parts of the mechanism intermediate the filling-fork slide and the shuttle-detector mechanism in or on the shuttle will be in the position shown in Fig. 1, and the loom will continue to operate unless the breaking or absence of filling operates the filling-fork slide to move the lever 18 and operate the knock-off lever 16 and the shipper-lever 15 to stop the loom. In case the extension 36' on the lever 36 is prevented from entering the aperture in the shuttle, on the beating up of the lay, by engagement with the latch which closes said aperture, as shown in Fig. 3, then said lever 36 is moved backward or toward the front of the loom and through arm 34 rocks the shaft 25 against the action of the spring 30 and moves the arm 24 fast on

said shaft 25, and through the arm 24 moves the lever 18 from the position shown in Fig. 1 to the position shown in Fig. 2. At the same time the rocking of the shaft 25 moves down the pin 29 to cause the forked end 12' of the filling-fork 12 to engage with the upper end of the cam-lever 14. The movement of the cam-lever 14 moves in the ordinary way the filling-fork slide 11 backward, and with it the lever 18. The backward movement of the lever 18 causes it to engage and move the arm 17 and rock the shaft (not shown) on which said arm 17 is fast and put into operation the filling-changing mechanism of any ordinary construction. (Not shown.) On the backward stroke of the lay the lever 36 is released, allowing the spring 30 to rotate the shaft 25 and disengage the pin 29 from the filling-fork 12. At the same time the spring 21 acts to move the lever 18 from the position shown in Fig. 2 to the position shown in Fig. 1, and the spring 11' returns the slide 11 to its normal position.

I will now describe the filling-detector mechanism shown in the drawings and which may be used in connection with the mechanism above described.

Referring to Figs. 5 to 11, inclusive, in the shuttle 7 is pivoted on a transverse pin 37 the spindle 38, carrying a cop 39, on which is wound the filling 40 in the ordinary way. The body of the shuttle at the spindle end is cut out to receive the filling-detector mechanism, and there is an aperture or opening 7' in the side of the shuttle 7, in this instance near the end and at the lower part thereof. A plate 41 is secured to the enlarged base or end 38' of the spindle 38. The plate 41 has bearings 41' for the spring-actuated rod 42 to rotate in. One end of the rod 42 is bent, as shown at 42', and has therein at its end a pin-point 43, which is adapted to extend under the wound filling at its reduced end. (See Fig. 6.) The movable latch 44 has hubs 44' thereon, which are fast on the rod 41 to move with said rod. A coil-spring 45 on the rod 42 is secured in this instance at one end to the latch 44 and at its other end to the plate 41. The spring 45 acts to rotate the rod 42, and with it the latch 44, to move said latch into its lowered position, as shown in Figs. 7 and 8, and close the aperture or opening 7' in the shuttle 7. When the pin-point 43 on the bent end 42' of the rod 42 is released by the filling being wound off from the cop 39 on the spindle 38—that is, upon substantial exhaustion of filling—the latch 44 is automatically closed to prevent the entrance of the extension 36' on the lever 36, as above described. A stop 6'' may be used to limit the downward movement of the latch 44.

In the filling-detector mechanism shown in Figs. 5 to 8 when the spindle 38 is raised out of the shuttle on its pivot-pin 37 the latch mechanism will move with it. A full cop is placed on the spindle, with the pin-point 43 held in position by the operator, to be forced

in between the threads of filling at the reduced end thereof and close to the cop on which the filling is wound, with a few winds of filling on the cop under the pin-point 43. As the filling is drawn off or unwound from the cop in the operation of the loom, when the pin-point 43 is uncovered and released the spring 45 will act to instantly rotate the rod 42 and move the latch 44 to close the aperture or opening 7' in the shuttle 7, as shown in Figs. 7 and 8.

In Figs. 9, 10, and 11 are shown a modified construction of the mechanism shown in Figs. 5 to 8, inclusive. Instead of the rod 42, having the curved end 42' with the pin 43 thereon, which acts as a feeler, I provide a separate feeler or detector device to engage the filling, which feeler consists of two prongs or pins 46, extending out from a hub 47, loosely mounted on a transverse stud 48, secured in the shuttle-body. Said pins 46 extend upon opposite sides of the cop 39 and engage the filling 40 thereon at its reduced end. Also extending from the hub 47 is an arm 49, which is adapted to extend over and engage a projection 50 on one hub 44' of the latch 44. (See Figs. 10 and 11.) An actuating-spring 45' encircles the rod 42 and is connected at one end to one of the bearings 51' and at the other end to the latch 44 and acts to rotate the rod 42 and the latch 44 to close the latch, as shown in Figs. 10 and 11. The plate having bearings 51' for the rod 42 is not attached to the base of the spindle to move with the spindle, but is secured in the body of the shuttle and is stationary. As the filling is drawn off of the cop in the operation of the loom when only a few winds of filling remain on the cop, the pins 46 will be free to move forward, as shown in Fig. 10, and the arm 49 will release the extension 50 on the hub 44', and the spring 45' will act to instantly rotate said shaft and move the latch 44 to close the aperture 7' in the shuttle 7, as shown in Figs. 10 and 11, and prevent the entrance of the projection 36' on the lever 36. The spring 45' acts, through engagement of the extension 50, on the hub 44' with the arm 49 to hold the two pins 46 in engagement with the filling, as shown in Fig. 9. To prevent the latch 44 from moving below the desired position in closing the aperture 7' in the shuttle 7, the arm 49 may be made to engage the spindle or the end of the cop, as shown in Fig. 9.

From the above description, in connection with the drawings, the operation of my improvements will be readily understood by those skilled in the art.

It will be understood that the details of construction of my improvements may be varied, if desired, and instead of the filling-detector mechanism in the shuttle which is shown in the drawings any other filling-detector mechanism may be used.

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

1. In a loom of the class described, a filling stop mechanism operating to indicate breakage of filling, a filling-detector mechanism to detect substantial exhaustion of filling in the running shuttle, and mechanism, intermediate the filling stop mechanism, and the filling-detector mechanism, automatically operated at the proper time, to stop the loom, or change the filling, substantially as shown and described.

2. In a loom of the class described, a filling stop mechanism operating to indicate breakage of filling, consisting of a filling-fork and filling-fork slide, and means for operating the slide on the breakage or absence of filling, a filling-detector mechanism to detect substantial exhaustion of filling in the running shuttle, and mechanism, intermediate the filling-fork and filling-fork slide, and the filling-detector mechanism, said mechanism automatically operated at the proper time to stop the loom, or change the filling, substantially as shown and described.

3. In a loom of the class described, the combination with the filling-detector mechanism to detect substantial exhaustion of filling in the running shuttle, and mechanism, intermediate the filling-detector mechanism, and the filling-fork, of the filling-fork and filling-fork slide, and a lever carried on said slide, and connected with the filling-detector mechanism, and automatically operated on substantial exhaustion of filling to put into operation the filling-changing mechanism,

and automatically operated on breakage of filling to stop the loom, substantially as shown and described.

4. In a loom of the class described, the combination with the filling-fork and filling-fork slide, of a pivoted lever, having a movement in a horizontal plane, and connected and moving with the filling-fork slide, said lever adapted to be automatically moved from its normal position, to put into operation the filling-changing mechanism on substantial exhaustion of filling, and to be automatically returned to its normal position to stop the loom, in case of breakage of filling, substantially as shown and described.

5. In a loom of the class described, the combination with the filling-fork and filling-fork slide, and mechanism, intermediate the filling-fork, and the filling-detector mechanism, of said filling-detector mechanism in or on the shuttle, and comprising a movable latch, and connections intermediate the latch and the filling, to be engaged by the filling, to hold the latch in its normal position, leaving a free opening into the shuttle, and on substantial exhaustion of filling to be released and allow the latch to close the opening in the shuttle, and means operated by the filling-fork slide to stop the loom or change the filling, substantially as shown and described.

GEORGE F. HUTCHINS.

Witnesses:

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