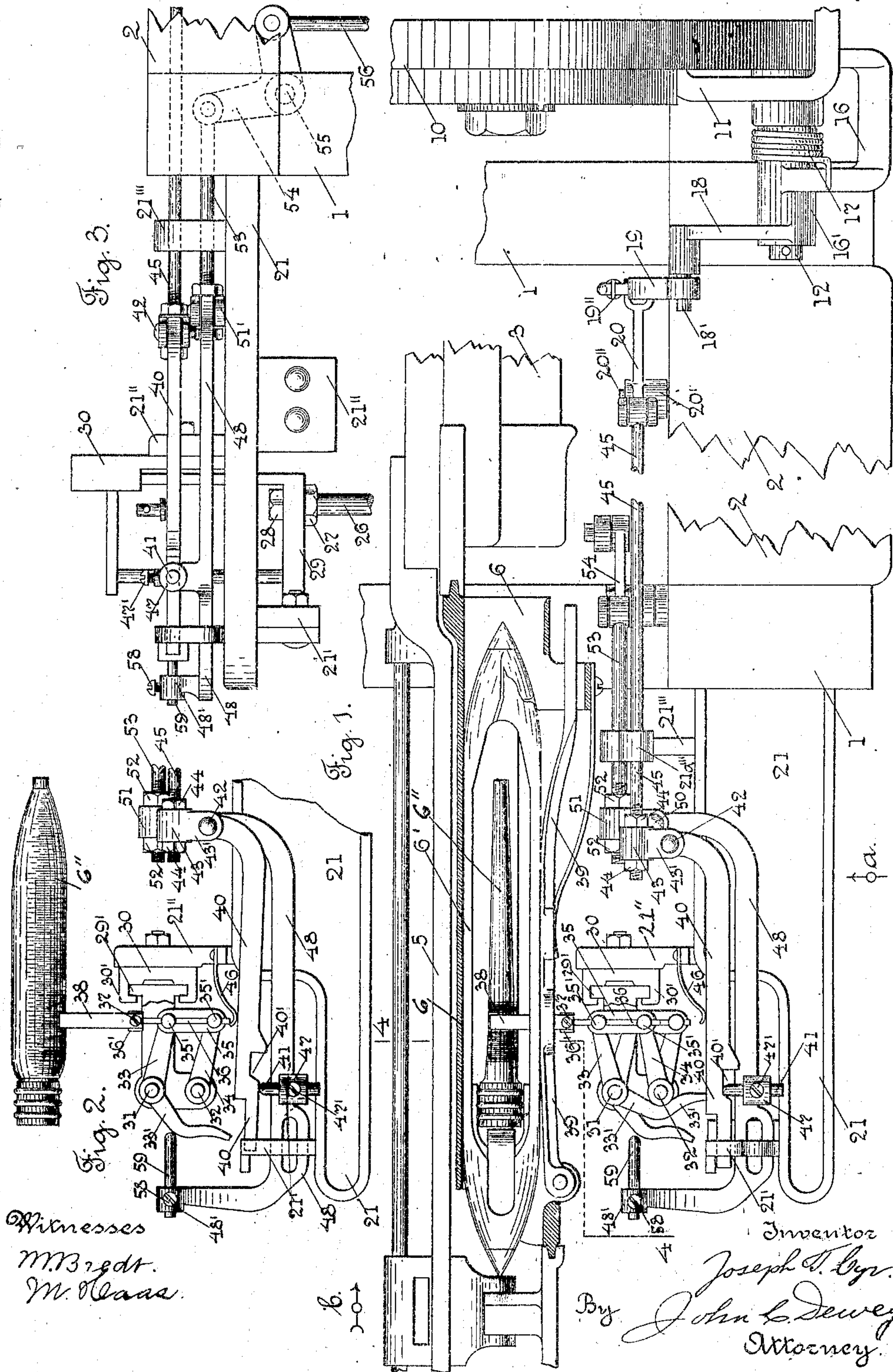


No. 364,956.

PATENTED SEPT. 3, 1907.

J. T. CYR.
WEFT REPLENISHING LOOM.
APPLICATION FILED OCT. 9, 1905.

3 SHEETS—SHEET 1.

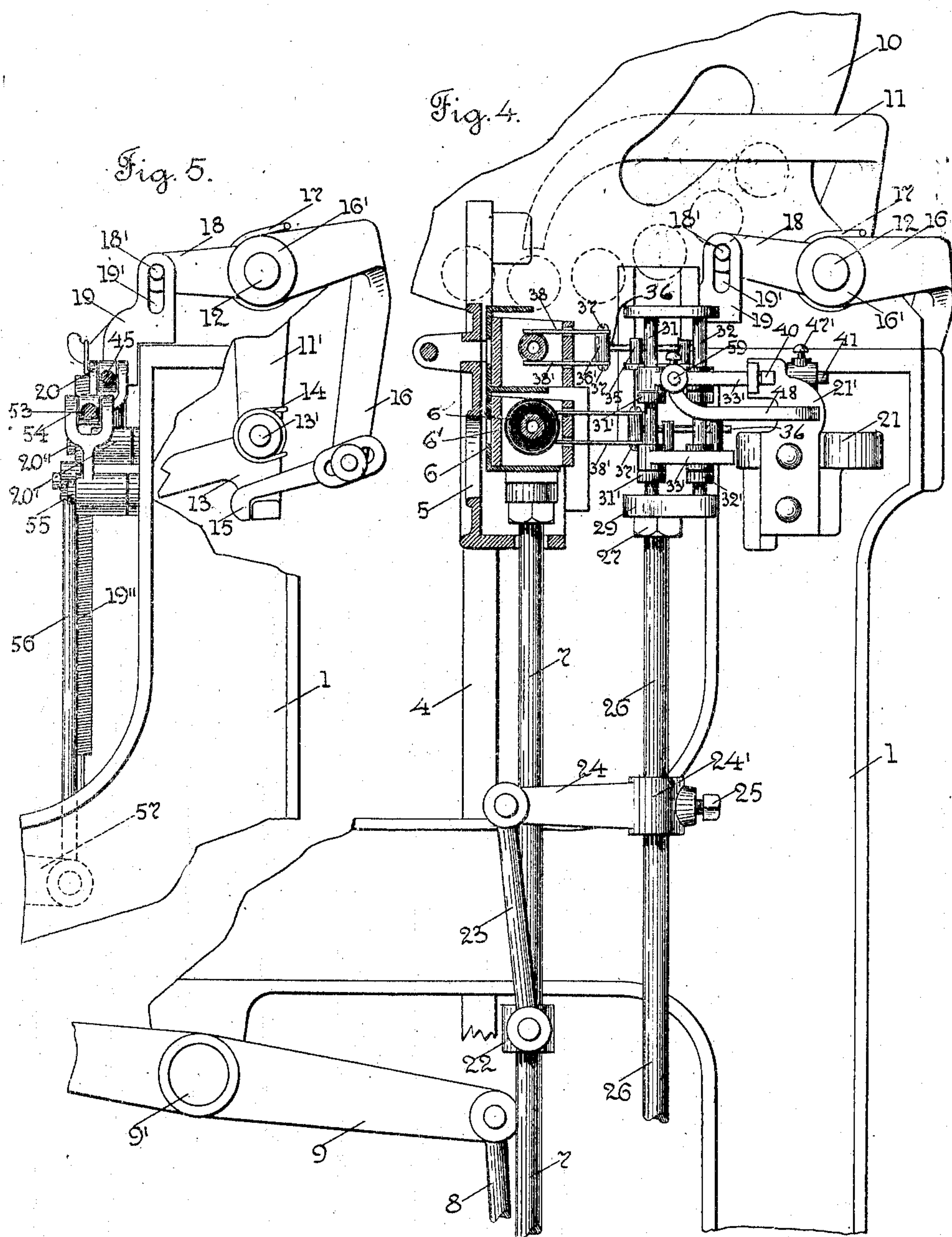


No. 864,956.

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J. T. CYR.
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APPLICATION FILED OCT. 9, 1905.

3 SHEETS—SHEET 2.



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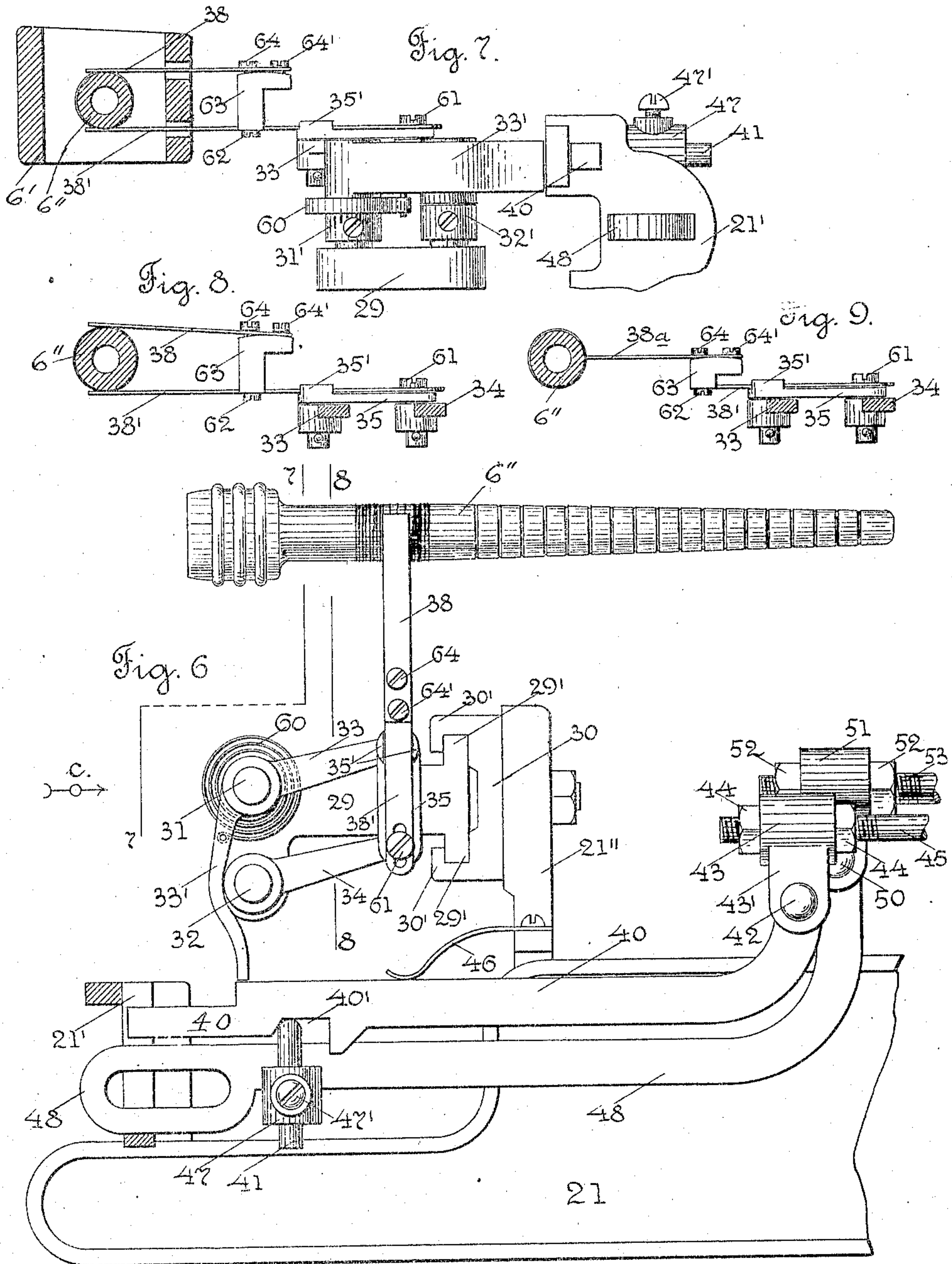
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WEFT-REPLENISHING LOOM.

No. 864,956.

Specification of Letters Patent.

Patented Sept. 3, 1907.

Application filed October 9, 1905. Serial No. 231,867.

To all whom it may concern:

Be it known that I, Joseph T. Cyr, 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 Weft-Replenishing Looms, of which the following is a specification.

My invention relates to weft replenishing looms, and to that class of looms which have filling changing mechanism, and shifting or drop shuttle boxes, and filling detector mechanism to detect substantial exhaustion of filling in the active shuttle, and cause the filling change mechanism to operate to supply fresh filling; and my invention particularly relates to the class of looms shown and described in U. S. Letters Patent No. 665,845, of January 8, 1901, in which the filling feelers of the filling detector mechanism move up and down with the shifting or drop shuttle boxes, so that the filling feelers will always maintain proper relation to the shuttle boxes, and feel for and detect the practical exhaustion of filling in the active shuttle.

The object of my invention is to improve upon the filling detector mechanism in the class of looms referred to, and to do away with the employment of electricity, or a magnetized feeler in connection with the filling detector mechanism, and to provide a mechanical filling detector mechanism in which the filling feelers for each shuttle box are preferably made in pairs, of caliper form, and are adapted to enter openings in the front of the shuttle box and the shuttle, and engage the filling carrier or bobbin above and below its central longitudinal axis.

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 detached portion of a loom having a magazine of the well known Northrop type, shown and described in U. S. Letters Patent, No. 529,940, of November 27, 1894, with my improvements combined therewith.

Referring to the drawings:—Figure 1 is a plan view of the front part of a detached portion of a loom with my improvements applied thereto, showing the filling changing mechanism at the right, and my filling detector mechanism at the left; the shuttle box is shown in section, and a shuttle in it with the filling on the bobbin substantially exhausted, and the parts of the filling detector mechanism in position to indicate for a supply of fresh filling. Fig. 2 shows the opposite position of some of the parts of the filling detector mechanism shown at the left in Fig. 1, and the filling feelers in engagement with a full bobbin. Fig. 3 is a front view of some of the parts shown at the left in Fig. 1, looking in the direction of arrow *a*, same figure. Fig. 4 is a section, on line 4, 4, Fig. 1, looking in the direc-

tion of arrow *b*, same figure. Fig. 5 shows some of the parts of the mechanisms not shown in Fig. 4. Fig. 6 shows, on an enlarged scale, a detached plan view of a modified construction of the filling detector mechanism shown at the left in Fig. 1. Fig. 7 is a section, on line 7, 7, Fig. 6, looking in the direction of arrow *c*, same figure, and shows also the shuttle in section. Fig. 8 is a section, on line 8, 8, Fig. 6, looking in the direction of arrow *c*, same figure, and, Fig. 9 corresponds to Fig. 8, but shows a modified construction of the filling feeler.

In the accompanying drawings, 1, 1, designate the loom sides or frames, 2 the breast-beam, 3 the lay, 4 the lay-sword, 5 the shuttle-box guide frame on the end of the lay, 6 the shuttle boxes, in this instance two in number, mounted on the upper end of the vertically moving shuttle box rod 7, which is connected at its lower part, not shown, through a connector 8 to the box lever 9 pivotally mounted at 9', in the usual way.

6' is the shuttle; and 6'' is the bobbin.

On the opposite end of the loom is a detached portion 10 of a magazine stand of the Northrop type, shown and described in U. S. Letters Patent, No. 529,940, above referred to.

11 is a transfer arm pivoted on a stud 12 and having the downwardly extending portion 11', see Fig. 5, carrying the dagger 13 pivotally mounted thereon on a pin 13', and actuated by a spring 14 to be raised into the path of a bunter on the lay, not shown, in the usual way, when released by the hook arm 15 adjustably attached to the lower end of the lever 16, the hub 16' of which is pivotally mounted on the stud 12. A spring 17 returns the arm 16 to, and holds it in its normal position. Extending out from the hub 16' is an arm 18, carrying a pin 18', which extends into an elongated vertical slot 19' in a vertically moving plate 19, operated through the angle lever 20, see Fig. 1, when a fresh filling is to be transferred from the magazine into the running shuttle. A spring 19'' acts to return the plate 19 to its normal position.

All of the above mentioned parts may be of the usual and well known construction in the class of looms referred to.

I will now describe my improvements, shown in Figs. 1 to 5, inclusive. A bracket or stand 21 is secured to the shifting shuttle box end of the loom, in this instance the left hand end, and extends out therefrom in a horizontal plane at the front part of the loom and in line with the breast-beam. The bracket or stand 21 has three extensions upon its inner side or edge, 21', 21'', and 21''', see Fig. 1, which form supports and guides for the different parts of my mechanism. The vertically moving box lifter rod 7 has a collar 22 fast thereon, which is connected by a link 23 with an arm 24, which

has a hub 24' adjustably secured by a screw 25 on a vertically moving rod 26. The rod 26 has the same vertical movement as the lifter rod 7 and shuttle boxes 6 carried thereon. There is a guide, not shown, for the lower end of the rod 26. The rod 26 has secured upon its upper end, in this instance by nuts 27 and 28, see Fig. 3, a stand 29, which has a vertical movement with the rod 26, and has its vertically extending portion 29' made with side extensions to extend into and travel in guides or ways 30' in a plate 30, secured to the extensions 21'' on the bracket 21, see Fig. 1. The stand 29 carries two vertically extending pins or studs 31 and 32, on which are loosely mounted the hubs of levers 33 and 34, which hubs are supported on the adjustable collars 31' and 32' on the pins 31 and 32, see Fig. 4. The levers 33 and 34 are connected by a link 35, to cause said levers to have a parallel motion. The link 35 has two upwardly extending pins 35' fast thereon, which have holes through their upper part, to receive and hold a wire 36, carrying a vertically extending block 36' at its inner end. To the upper end of the block 36' is secured, in this instance by a screw 37, a horizontal feeler blade 38, and to the lower end of the block 36' is secured, in this instance by a screw 37', a second feeler blade 38'. The two blades 38 and 38' are substantially parallel to each other, and extend one above the other, with their inner ends adapted to enter, as the lay beats up, an opening or openings in the shuttle binder 39, and openings in the front side of the shuttle, to engage the filling on the bobbin, in case of a full bobbin, see Fig. 2, or to receive the bobbin between them in case of a substantial exhausted bobbin, see Fig. 1, and thus act as filling detectors. One of the levers, preferably the inner lever 33, has an arm 33' extending out from the hub of said lever, and when the filling feelers 38 are in their inward position, with the filling on the bobbin in the shuttle substantially exhausted, as shown in Figs. 1 and 4, the free end of the arm 33' is in engagement with the inner edge of a bar 40, to hold said bar against a pin 41, which extends into a recess 40' in the rear edge of said bar 40. The outer free end of the bar 40 is supported on and guided by the extension 21' on the bracket 21, and the inner end of said bar is pivotally connected at its inner end by a stud 42 with an extension 43' on a collar 43, which is adjustably secured by nuts 44 on the end of the longitudinally moving rod 45, which is supported and has a bearing in a hub 21''' on the end of the stand 21'', see Fig. 1. The rod 45 is pivotally connected at its opposite end with one arm 50 of the angle lever 20, the hub 20' of which is pivotally mounted on a stud 20'', see Fig. 1, the other arm of the angle lever 20 is connected with the vertically moving plate 19, as above described. A leaf spring 46 is attached at one end to the stand 21'', and bears at its other free end against the inner edge of the bar 40, and acts to move said bar outwardly. A pin 41 which is adapted to extend at its inner end into the recess 40' in the outer edge of the bar 40, is adjustably secured by a screw 47' in a hub 47 on a sliding bar 48, which is pivotally connected at its inner end by a stud 50 to a projection 51' on a collar 51, secured by two nuts 52 on one end of a longitudinally sliding rod 53. The rod 53 is supported and has its bearing in a hub on the end of the stand 21'''. The other end of the rod 53 is pivotally connected with one arm of an angle lever 54, the hub of

which is pivotally mounted on a pin 55, see Figs. 3 and 5. The other arm of the angle lever 54 is connected through a link 56 with a lever 57, which has a rocking up and down movement communicated thereto at regular intervals, from a cam, not shown, on a driven part of the loom. The outer end of the sliding bar 48 extends through an opening in the support 21', secured to the bracket 21, see Fig. 4, and is bent at an angle to the main portion, and has a hub 48' at its extreme end, in which is secured, by a screw 58, a pin 59. There are a set of levers 33 and 34, and a link 35, a wire 36, block 36', and feeler blades 38, and 38' for each shuttle box of the drop shuttle boxes, in this instance two drop shuttle boxes are shown, and two sets of levers 33 and 34, and parts connected therewith. In case of additional shuttle boxes, there will be additional sets of levers 33 and 34, and parts connected therewith.

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

When the filling on the bobbin in the running shuttle in the top box is substantially exhausted, as shown in Figs. 1, and 4, the parts of my filling detector mechanism, when the lay is at its forward stroke, will be in the position shown in Figs. 1, and 4, the arm 33' being in engagement with the inner edge of the sliding rod 40, and holding the notch 40', in the outer edge of said sliding rod, in engagement with the inner end of the pin 41. The longitudinal movement of the sliding rod 48, in the manner above described, in an outward direction, will carry the sliding rod 40 with it, and through the rod 45 will move the angle lever 20 to raise the plate 19, against the action of the spring 19'', and allow the spring 17 to move the lever 16, and disengage the hook arm 15, to allow the dagger 13, operated by the spring 14, to move into the path of the bunter on the lay, and through the engagement of the bunter with the dagger, operate the transferer 11 to supply fresh filling, in the usual and well known way.

The operation of the filling detector mechanism is so timed, that after the filling feelers or blades 38 and 38' have indicated for a supply of fresh filling, the shuttle, having the substantially exhausted bobbin therein, is thrown to the other side of the loom to receive a fresh bobbin. When the bobbin in the running shuttle is full of filling, and until it becomes substantially exhausted, the engagement of the ends of the filling detectors or blades 38 and 38' with the filling on the bobbin, as shown in Fig. 2, and in the lower box in Fig. 4, as the lay beats up, moves backwardly said blades, and with them the link 36 and the levers 33 and 34, into the position shown in Fig. 2, disengaging the arm 33' from the rear edge of the sliding bar 40, leaving said bar free to move on its pivotal support, and thus allow the inner end of the pin 41 to move out of the notch 40' in said bar 40, in the movement of the sliding bar 48, without moving said bar 40 and operating the filling changing mechanism. On the return movement of the sliding bar 48, the pin 59 will engage the arm 33' on the lever 33, and move said lever, to cause the free end thereof to engage the inner edge of the sliding bar 40, after the pin 41 passes into the notch 40', as shown in Fig. 1, and this operation is repeated at regular intervals as the loom operates.

Referring now to the modified construction shown in Figs. 6 to 9, inclusive. In said figures is shown one filling detector mechanism for one shuttle box. The same figures of reference are used on the parts corresponding to similar parts in the other figures. The sliding bar 48 in Fig. 6 is not provided with the extended end carrying the pin 59, shown in Fig. 1, as the lever 33 is spring actuated, to cause the feeler blades 38 and 38' to feel into the shuttle box. In this instance a light coil leaf spring 60, of a watch-spring type, is attached at one end to the projecting arm 33', and at its other end to the adjustable collar 31' of the lever 33.

The manner of attaching the two feeler blades 38, and 38', shown in Figs. 6, 7, and 8, is modified from the construction shown in the previous figures of the drawings. The lower feeler blade 38', see Fig. 8, has its inner end extended and preferably provided with an elongated opening, see Fig. 6, for adjustment, and is secured by a screw 61 upon the upper end of the link 35, and is held in position between two lips or flanges 35' on the other end of the link 35. The feeler blade 38' has secured thereto, by a screw 62, a block 63, the upper end of which is preferably slightly curved or rounded, and has secured thereto by two screws 64 and 64', the outer end of the upper feeler blade 38, see Fig. 8. By means of the rounded surface on the upper end of the block 63, the horizontal plane of the feeler blade 38 may be adjusted, to cause the inner end of the feeler blade to be nearer the end of the feeler blade 38', by turning in the inner screw 64, and turning out the outer screw 64', as shown in Fig. 7, or the inner end of the feeler blade 38 may be moved farther away from the feeler blade 38', as shown in Fig. 8, by turning in the outer screw 64', and by turning out the inner screw 64. By means of this adjustment of the feeler blades, the amount of filling to be left on the bobbin may be regulated.

In Fig. 9 instead of the two feeler blades 38 and 38', a single feeler blade 38^a is shown, which is adapted to enter a single hole in the shuttle, and engage the bobbin at one point, preferably the central front portion, to detect substantial exhaustion of filling thereon.

It will be understood that the loom will continue to operate normally, until on the substantial exhaustion of filling on the bobbin in the running shuttle, the feeler blades 38 and 38' indicate for a change of filling, when the filling changing mechanism will operate in the manner above described, to supply fresh filling.

It will be understood that the details of construction of my improvements may be varied if desired, and they may be adapted to be applied to weft replenishing looms of different kinds, in which one or more shuttle boxes, at the end of the loom opposite from the magazine, are used.

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 a weft replenishing loom, a pair of feelers of caliper form, adapted to feel

for the filling through the front side of a shuttle, two pivoted levers having a parallel motion supporting said feelers, means for moving said levers to move forward the feelers, and connections intermediate said levers and the filling changing mechanism, to cause the operation of said mechanism upon the substantial exhaustion of filling in the running shuttle.

2. In a filling detector mechanism for a weft replenishing loom, having shifting or drop shuttle boxes, a pair of feelers of caliper form, for each shuttle box, adapted to feel for the filling through the front side of a shuttle, two pivoted levers having a parallel motion supporting said feelers, means for moving said levers to move forward the feelers, and connections intermediate said levers and the filling changing mechanism, to cause the operation of said mechanism upon the substantial exhaustion of filling in the running shuttle.

3. In a filling detector mechanism for a weft replenishing loom having shifting or drop shuttle boxes, a pair of feelers of caliper form, for each shuttle box, adapted to feel for the filling through the front side of a shuttle, two pivoted levers having a parallel motion supporting said feelers, means for moving said levers to move forward the feelers, and connections intermediate said levers and the filling changing mechanism to cause the operation of said mechanism upon the substantial exhaustion of filling in the running shuttle, said connections comprising a pivoted longitudinally moving bar connected to the transfer mechanism of the filling changing mechanism, and a second longitudinally moving bar, carrying means to engage and move the first mentioned bar when held in engagement with said means, and means for operating said second mentioned bar.

4. In a filling detector mechanism for a weft replenishing loom, a movable feeler adapted to feel for the filling through the front side of a shuttle, two pivoted levers having a parallel motion supporting said feeler, means for moving said levers to move forward the feeler, and connections intermediate said levers and the filling changing mechanism, to cause the operation of said mechanism upon the substantial exhaustion of filling in the running shuttle.

5. In a filling detector mechanism for a weft replenishing loom having shifting or drop shuttle boxes, a movable feeler for each shuttle box, adapted to feel for the filling through the front side of a shuttle, two pivoted levers having a parallel motion supporting said feeler, means for moving said levers to move forward the feeler, and connections intermediate said levers and the filling changing mechanism, to cause the operation of said mechanism upon the substantial exhaustion of filling in the running shuttle.

6. In a filling detector mechanism for a weft replenishing loom having shifting or drop shuttle boxes, a movable feeler for each shuttle box, adapted to feel for the filling through the front side of a shuttle, two pivoted levers having a parallel motion supporting said feeler, means for moving said levers to move forward the feeler, and connections intermediate said levers and the filling changing mechanism, to cause the operation of said mechanism upon the substantial exhaustion of filling in the running shuttle, said connections comprising a pivoted longitudinally moving bar connected to the transfer mechanism of the filling changing mechanism, and a second longitudinally moving bar, carrying means to engage and move the first mentioned bar, when held in engagement with said means, and means for operating said second mentioned bar.

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