

No. 764,326.

PATENTED JULY 5, 1904.

H. WYMAN.
WEFT REPLENISHING LOOM.

APPLICATION FILED JAN. 9, 1904.

NO MODEL.

4 SHEETS—SHEET 1.

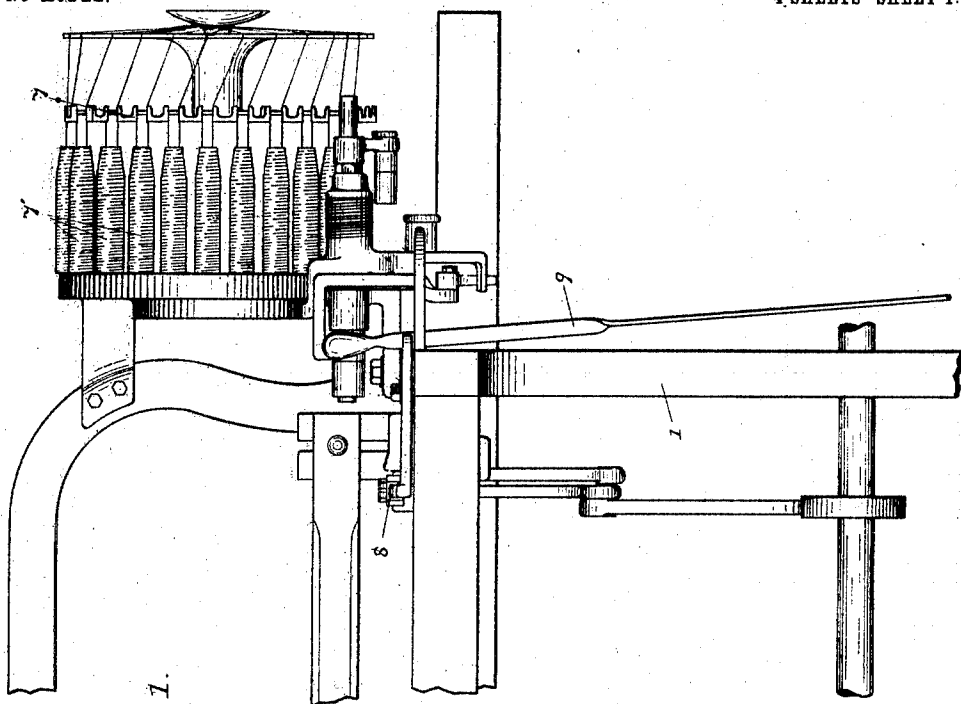
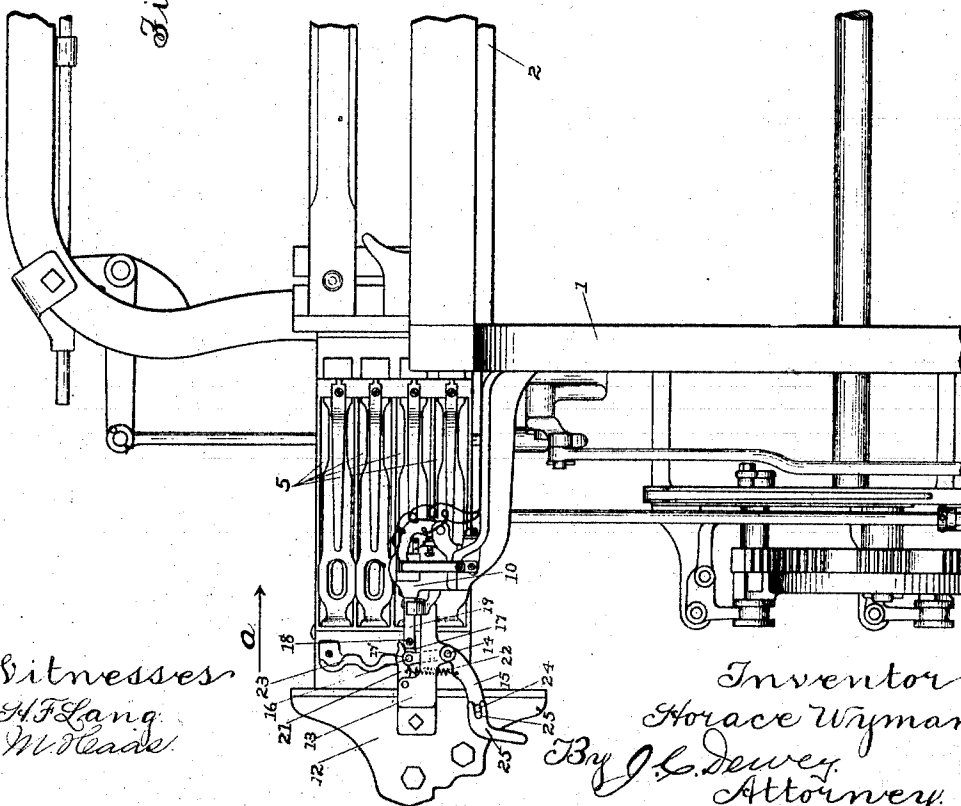


Fig. 1.



Witnesses
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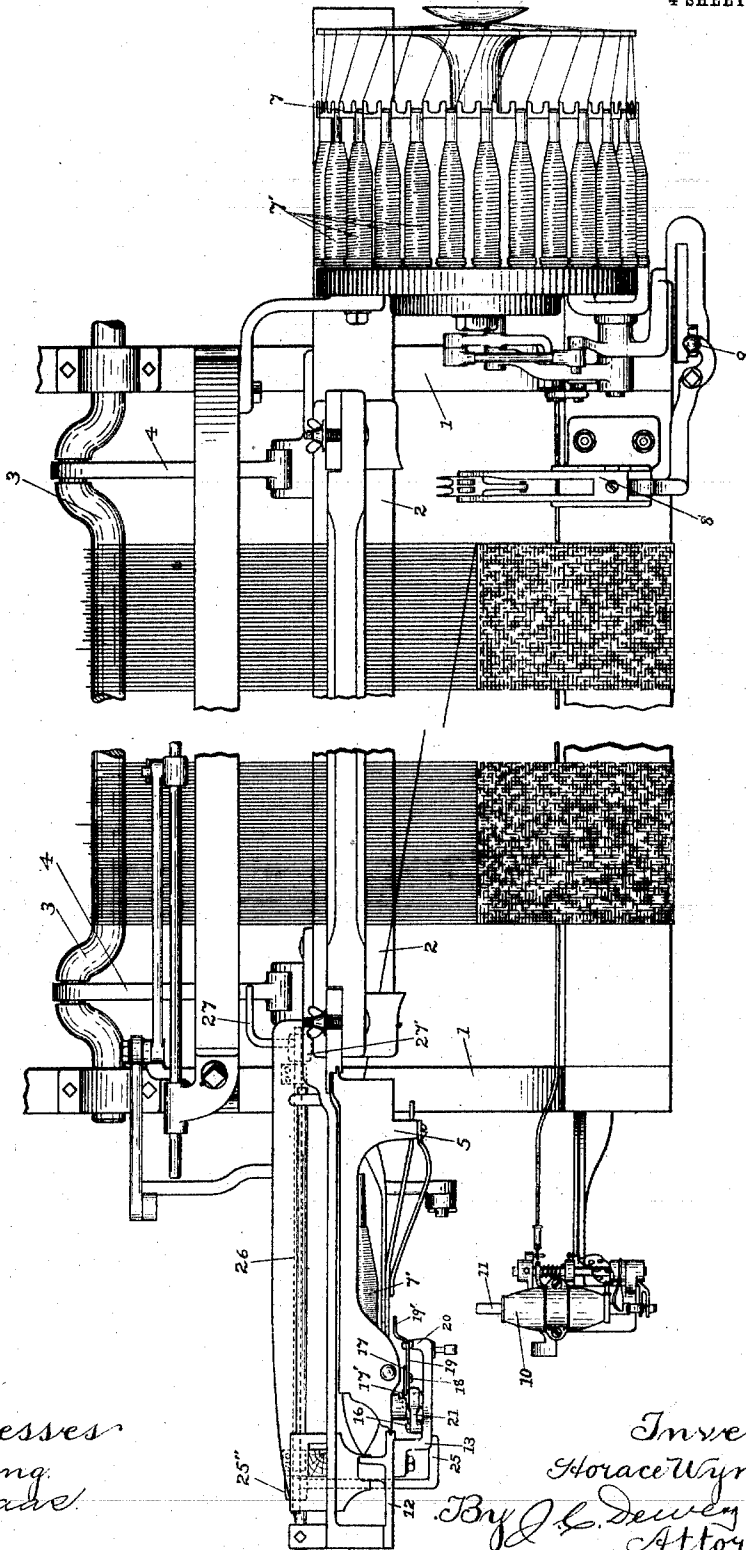
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4 SHEETS—SHEET 2.

Fig. 2.



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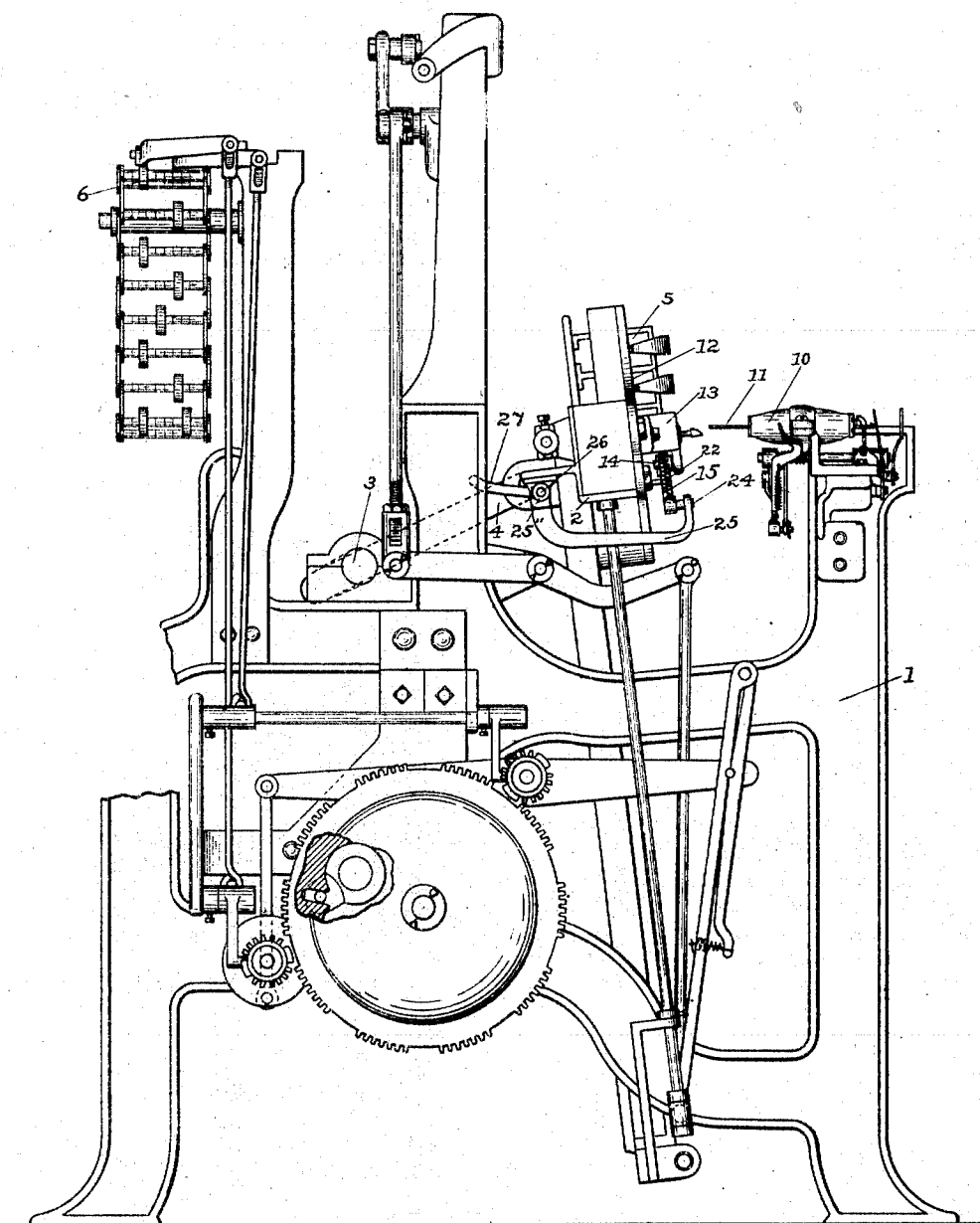
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4 SHEETS—SHEET 3.

Fig. 3.



Witnesses

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4 SHEETS—SHEET 4.

Fig. 4

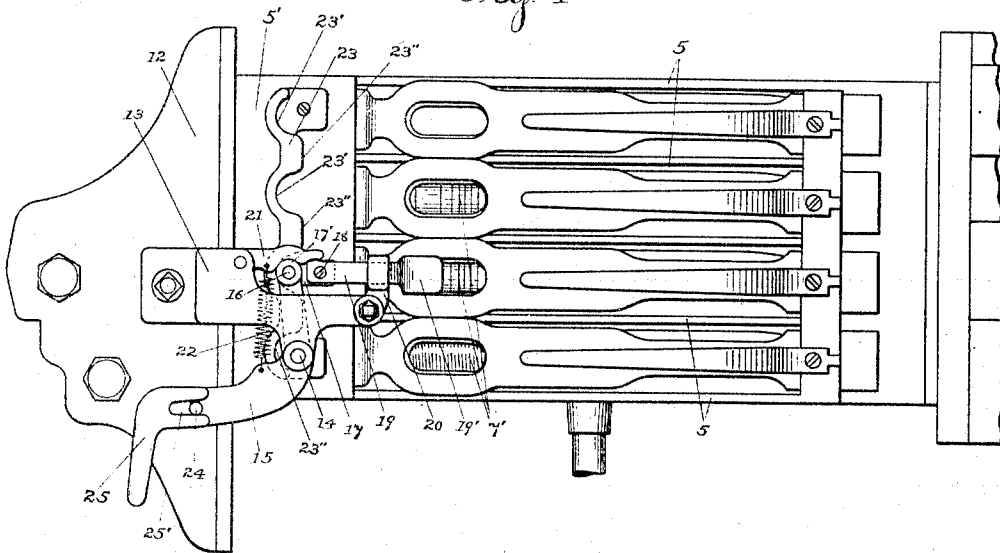


Fig. 5.

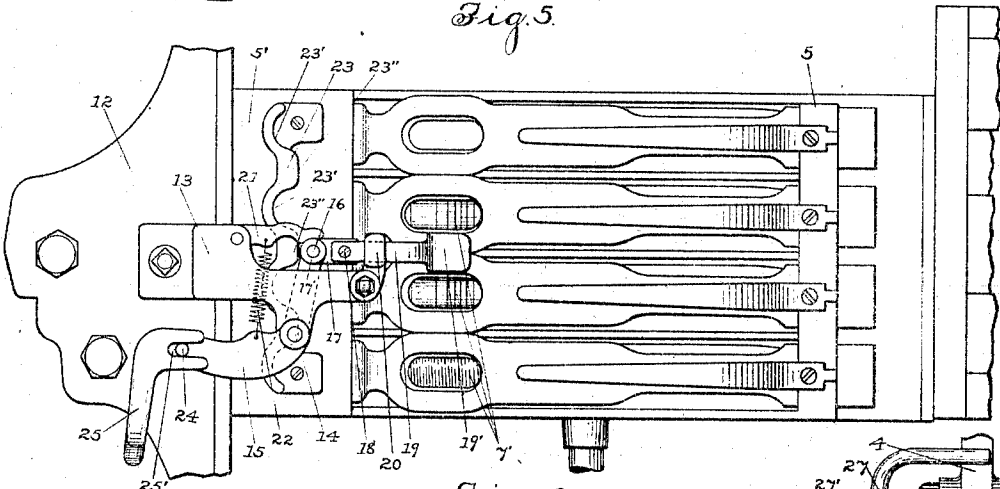
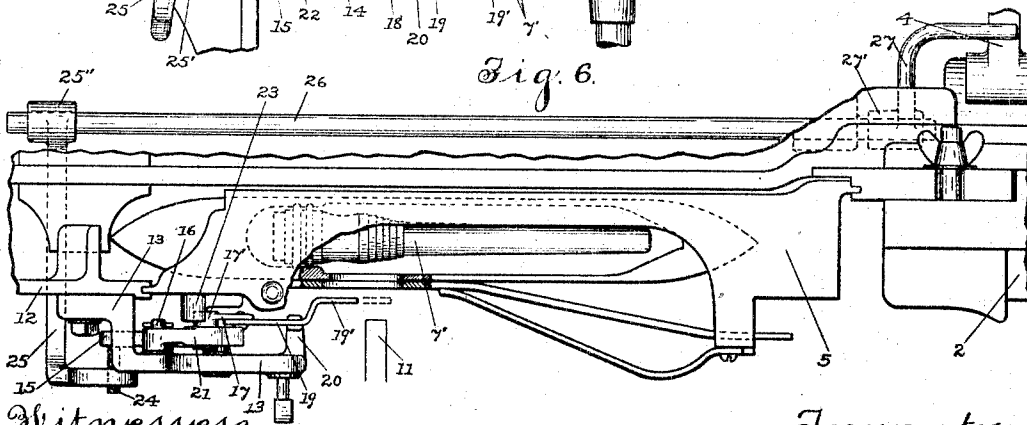


Fig. 6.



Witnesses,

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UNITED STATES PATENT OFFICE.

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WEFT-REPLENISHING LOOM.

SPECIFICATION forming part of Letters Patent No. 764,326, dated July 5, 1904.

Application filed January 9, 1904. Serial No. 188,283. (No model.)

To all whom it may concern:

Be it known that I, HORACE WYMAN, 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 looms, and particularly to that class of looms in which filling-changing mechanism is used to effect a supply of fresh filling without stopping the loom when the filling in the active shuttle has become practically exhausted, and more particularly to a loom having shifting or changing shuttle-boxes.

In adapting a filling-changing mechanism to a shifting or changing shuttle-box loom I have found it desirable to locate the filling-detector mechanism, or the mechanism which feels for and detects the condition of practical exhaustion of the filling, at the opposite side of the loom from the filling-changing mechanism in order to obviate the sudden and quick action of the filling-changing mechanism.

In the practical embodiment of my improvements, as shown in the drawings and hereinafter described, I have selected that type of loom which has a single shuttle-box at one side and a plurality of shifting or changing shuttle-boxes at the other side thereof. In providing this type of loom with filling-detector mechanism and filling-changing mechanism I have found it also desirable to locate the filling-changing mechanism on the side of the loom adjacent the fixed shuttle-box and the filling-detector mechanism on the side of the loom adjacent the shifting or changing shuttle-boxes. In connection with this arrangement of mechanisms I have provided means whereby as the shifting shuttle-boxes move up and down in answer to the call of the pattern-surfaces the feeler of the filling-detector mechanism will be held in an inoperative position and prevented from engaging with the shuttle-boxes during their shifting movement. If the detection occurs when a shuttle is in position to be picked into the box on the filling-changing-mechanism side of the loom,

mechanism will be put into action to effect a change of filling when the practically exhausted shuttle has reached said box; but if the detection occurs when the practically exhausted shuttle is not in position to be picked into the box on the filling-changing-mechanism side of the loom then said mechanism will not be put into action.

In the practical operation of looms with shifting shuttle-boxes of the type shown in United States Letters Patent No. 221,237, of November 4, 1879, and No. 227,667, of May 18, 1880, when a change of shuttles is indicated the movement of the shuttle-boxes to change from one box to another commences immediately when the running shuttle has arrived in its box and when the lay is at about one-half of its forward position, and said movement of the boxes is continued until the lay arrives at its forward position and returns to about one-half of its backward position, the box movement having then fully completed the shifting from one box to the other desired, and a new shuttle is ready to be thrown across the lay. Consequently it will be seen that if in looms having shifting shuttle-boxes and mechanism to move them, as above described, a filling feeler or detector should be placed in a fixed position on the loom-frame, as shown and described in United States Letters Patent No. 665,559, of January 8, 1901, said filling-feeler would, if the shuttle-boxes remained in their normal stationary position, enter a cell of the boxes when the lay is in its most forward position through an opening in the binder, which retains the shuttle in the cell, and also through an opening in the side of the shuttle to contact with the filling carried in the shuttle; but when a shift or change of the shuttle-boxes takes place to change from one shuttle to another the shuttle-boxes when the lay is in its most forward position and at the time the filling-feeler should contact with the filling are moving most rapidly, making it impossible for the filling-feeler to enter through the opening in the shuttle-binder and the opening in the side of the shuttle to contact with the filling carried in the shuttle.

The object of my invention is to provide an improvement in filling-detector mechanism, and more particularly a supplemental mechanism adapted to be used in connection
5 with a filling-detector mechanism on the type of looms referred to, having filling-changing mechanism and shifting or changing shuttle-boxes.

In carrying out my improvements I place
10 the filling-detector mechanism in a fixed position on the loom-frame, and I provide mechanism to engage and move the feeler of the filling-detector mechanism when the shuttle-boxes are shifting and at the time they are
15 at their forward position, so that as they move up or down the feeler will be retained in a backward position and clear of any of the moving parts of the shuttle-boxes. By providing mechanism for engaging and moving
20 the feeler backward and retaining it in its backward position clear of any of the moving parts of the shuttle-boxes during their shifting operation, as above described, I am enabled to operate the loom practically at the
25 usual speed of fast-running looms not only when the shuttle-boxes are stationary with only one box in position and with only one running shuttle, but also when there are a set of shifting or changing shuttle-boxes
30 each provided with a shuttle which will pass the feeler of the detector mechanism during the shifting of the boxes and when the lay is in its most forward position and in the position in which the feeler of the detector
35 mechanism, as heretofore placed on the loom-frame in looms having a single shuttle-box, have always contacted with the filling in the shuttle. In my improvements when the
40 change of shuttle-boxes occurs the action of the feeler of the filling-detector mechanism on the filling in the last-running shuttle will be omitted, and if the filling was then practically exhausted instead of the filling-changing
45 mechanism being called upon to supply fresh filling in that shuttle at the next movement of the lay another shuttle from one of the other boxes will be brought into action, and the loom will continue to operate in the
50 usual manner until the time when the shuttle with the exhausted filling is again, by the shifting of the shuttle-boxes, brought into action. When this occurs and said shuttle is
55 thrown across the lay with the filling entirely exhausted therefrom, then the filling-fork detector mechanism common to the ordinary plain looms, with which my loom is also provided, will act to stop the loom, and the shuttle with the exhausted filling will be supplied
60 with new filling by hand in the usual manner. I have shown in the drawings parts of a loom of well-known type having a filling-changing mechanism at one side of the loom and shifting or changing shuttle-boxes and a filling-detector mechanism at the other side of the loom
65 with my improvements applied thereto, suffi-

cient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings, Figure 1 is a front view of parts of a loom and my improvements applied thereto. Fig. 2 is a plan view of some
70 of the parts shown in Fig. 1. Fig. 3 is an end view of the parts shown in Fig. 1 looking in the direction of arrow *a*, same figure, and showing some parts not shown in Fig. 1. Fig.
75 4 is, on an enlarged scale, a front view of the shuttle-box frame and shifting shuttle-boxes shown in Fig. 1 detached, showing my improvements combined therewith. Fig. 5 corresponds with Fig. 4, but shows a different
80 position of the shuttle-boxes and a different position of my mechanism; and Fig. 6 is a plan view of the parts shown in Fig. 3 and some additional parts and shows also the projecting
85 end of the filling-feeler.

The several parts of the loom shown in the
85 drawings, including the filling-changing mechanism, the filling-detector mechanism, and the shifting shuttle-box-operating mechanism, are of well-known construction and operation and are fully shown and described in
90 United States Letters Patent No. 227,667, of May 18, 1880, No. 600,053, of March 1, 1898, and No. 665,559, of January 8, 1901, and therefore it will not be necessary to describe the
95 same herein, and I will only briefly mention the several parts in connection with the description of my improvements.

In the accompanying drawings, 1 is the loom-frame.

2 is the lay, pivotally supported at its lower
100 end in the usual way and operated from the crank-shaft 3 through connectors 4. At one end of the lay 2, in this instance the right-hand end, is a stationary shuttle-box, (not shown,) and at the other end of the lay, in this instance
105 the left-hand end, are the shifting or changing shuttle-boxes 5, in this instance four in number. The raising and lowering or the shifting of the shuttle-boxes 5 is governed by the indications of the pattern-chain 6 (shown
110 in Fig. 3) through connections to the shuttle-box-operating mechanism, (shown in said Fig. 3,) which mechanism is of well-known construction and operation and is fully described
115 in said Patent No. 600,053. In case a movement of the shuttle-boxes 5 is indicated by the pattern-chain 6 this movement commences when the lay is at about one-half of its forward position, and said movement of the boxes
120 terminates when the lay reaches about one-half of its backward position.

7 is the revolving magazine of the filling-changing mechanism, located on the right-hand side of the loom over the stationary shuttle-box and carrying the filling-bobbins 7'.
125 The filling-changing mechanism is of the well-known Northrop loom type, fully shown and described in United States Letters Patent No. 525,940, of November 27, 1894.

8 is the filling-fork detector mechanism for 130

operating the shipper-lever 9 on the exhaustion or breaking of filling in the active shuttle in the ordinary and well-known way.

The filling-detector mechanism 10 is shown located on the left-hand side of the loom in front of the shifting shuttle-boxes 5. Any well-known type of filling-detector mechanism may be used in which a feeler is employed the end of which is adapted to enter an opening in the binder and an opening in the side of the shuttle to contact with the filling on the forward movement of the lay. In this instance the filling-detector 10 is of substantially the same construction and operation as the filling-detector mechanism shown and described in United States Letters Patent No. 665,559, of January 8, 1901, and has a magnetized feeler 11, the projecting end of which is in position to enter an opening in the shuttle-binder and an opening in the side of the shuttle to contact with the filling of an active shuttle when the shuttle-box carrying the shuttle is in line with the race of the lay as the lay advances to its most forward position. The feeler 11 in case of the exhaustion of filling in the active shuttle acts in the ordinary and well-known way through intermediate connections to operate the filling-changing mechanism to supply new filling.

All of the above-mentioned parts may be of the ordinary and well-known construction in the type of looms on which my improvements are adapted to be used.

I will now describe my improvements which are particularly adapted to be applied to and used on looms of the type above referred to.

On the front of the frame 12 at the end of the lay 2, which serves as a guide for the outer edge of the shifting shuttle-boxes 5, is secured a bracket 13, carrying a pin 14, on which is pivotally mounted an angle-lever 15. One end of the angle-lever 15 carries a pin 16, on which is pivotally mounted a hub 17' of an arm 17. To the arm 17 is detachably secured, in this instance by a screw 18, one end of an arm or shield 19, the enlarged end 19' of which is adapted to extend in the path of and engage the end of the feeler 11, as shown in Fig. 6.

The arm or shield 19 is supported and has a reciprocating motion in a guide-arm 20, secured to the bracket 13. On the bracket 13 is pivotally supported a check-lever 21, which has two recesses in its under surface adapted to engage the hub 17' on the arm 17 and through the action of the spring 22 to hold the arm or shield 19 in its outer position, as shown in Figs. 4 and 6, in which position it is out of the path of the feeler 11 or in its inner position, as shown in Fig. 5, in which position it is in the path of the feeler 11 and engages and holds said feeler in its backward position during the shifting of the shuttle-boxes 5.

Secured on the outer end 5' of the shifting shuttle-boxes 5 is a plate 23, having in this in-

stance four recesses 23' therein, corresponding to the number of the shifting shuttle-boxes 5, and three projecting surfaces 23'' intermediate said recesses 23', as shown in Figs. 3 and 4. As the shuttle-boxes 5 are shifted or raised and lowered the engagement of a projection 23'' with the hub 17' on the arm 17 will move said arm and also the shield 19 to carry the shield from its inoperative position (shown in Fig. 4) to its operative position (shown in Fig. 5) and in the path of the feeler 11, and as the lay advances to its forward position the shield 19 will engage with the feeler 11 and move it back and away from the shuttle-boxes as they are shifting from one position to another.

On the lower arm of the angle-lever 15 is a pin 24, which extends into an open end slot 25' in the bent end of the arm 25, the hub 25'' of which is fast on the outer end of the rock-shaft 26, mounted in suitable bearings at the back of the end of the lay, as shown in Fig. 6. On the inner end of the rock-shaft 26 is fast the hub 27' of an arm 27, the end of which is bent to extend over the connector 4, as shown in Figs. 2 and 6. As the lay moves backward and the shifting of the shuttle-boxes 5 is being completed the connector 4 moves upward, raising the arm 27 and rotating the rock-shaft 26 to move down the arm 25 and through the slot 25' engaging the pin 24 move the angle-lever 15, and with it the shield 19, to cause said shield to move from its operative position (shown in Fig. 5) to its inoperative position, (shown in Fig. 4,) where it is held by the check-lever 21 and where it will remain until another change is made in the position of the shuttle-boxes 5, when through the engagement of the projections 23'' on the plate 23 the angle-lever 15 will be moved and the shield 19 also moved to its operative position (shown in Fig. 5) to engage and move backward the feeler 11 on the forward movement of the lay, as above described. On the backward movement of the lay the engagement of the connector 4 with the arm 27 will operate, through rock-shaft 26 and arm 25, the angle-lever 15 and shield 19 to bring the shield into its inoperative position, as above described.

From the above description, in connection with the drawings, the operation of my improvements, which are intended to prevent the entrance of the filling-feeler into the opening in the shuttle-binder and in the shuttle on the forward movement of the lay during the shifting or raising and lowering of the shuttle-boxes, will be readily understood by those skilled in the art. In case of the shifting or the raising or lowering of the shuttle-boxes 5 the arm or shield 19 is automatically moved into position to extend in the path of and engage the end of the filling-feeler on the forward movement of the lay and move backward said feeler and hold it out of contact with the shuttle-boxes during the movement

of the boxes, and on every backward movement of the lay the shield 19 is automatically moved into its inoperative position or out of the path of the feeler 11. In case there is no shifting of the shuttle-boxes then the shield 19 is held in its inoperative position or out of the path of the filling-feeler, and said feeler is free to enter through the opening in the shuttle-binder and in the shuttle-box to contact with the filling and on the exhaustion of filling will indicate for the operation of the shuttle-changing mechanism.

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 any ordinary construction of loom of the type referred to having filling-changing mechanism and filling-detector mechanism. They also may be adapted to be applied to looms with shifting or changing shuttle-boxes at each end of the loom to stop the loom upon the substantial exhaustion of filling in any one shuttle.

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

1. In a loom, the combination with shifting shuttle-boxes carried on the lay, and a filling-detector mechanism in a fixed position, of mechanism, intermediate the shuttle-boxes and the filling-detector mechanism, which is operated when the shuttle-boxes are shifting, to render the feeler of the filling-detector mechanism inoperative, substantially as shown and described.

2. In a loom, the combination with shifting shuttle-boxes, carried on the lay, and a filling-detector mechanism in a fixed position, of mechanism, intermediate the shuttle-boxes and the filling-detector mechanism, which is operated when the shuttle-boxes are shifting, to render the feeler of the filling-detector mechanism inoperative, and mechanism for operating said intermediate mechanism, substantially as shown and described.

3. In a loom, the combination with shift-

ing shuttle-boxes, carried on the lay, and mechanism to move said boxes, and filling-detector mechanism, having a feeler adapted to enter a shuttle-box on the forward movement of the lay to contact with the filling, of mechanism intermediate the shuttle-boxes and the feeler of the filling-detector mechanism, which mechanism is operated when the shuttle-boxes are shifting, to prevent the feeler engaging the boxes, substantially as shown and described.

4. In a loom, having filling-changing mechanism, shifting shuttle-boxes, and filling-detector mechanism, with a feeler adapted to enter a shuttle-box and contact with the filling, a supplemental mechanism, intermediate the shuttle-boxes and the feeler of the filling-detector mechanism, having a member which, during the shifting of the shuttle-boxes, is moved into the path of and engages said feeler, to prevent it from engaging the boxes, substantially as shown and described.

5. In a loom, having filling-changing mechanism, shifting shuttle-boxes, and filling-detector mechanism, with a feeler adapted to enter a shuttle-box and contact with the filling, a supplemental mechanism, intermediate the shuttle-boxes and the feeler of the filling-detector mechanism, which is operated during the shifting of the shuttle-boxes, to render said feeler inoperative, substantially as shown and described.

6. In a loom, the combination with filling-changing mechanism, shifting shuttle-boxes, and filling-detector mechanism with a feeler adapted to enter a shuttle-box and contact with the filling, of a supplemental mechanism, intermediate the shuttle-boxes and the feeler of the filling-detector mechanism, which is operated during the shifting of the shuttle-boxes, to render said feeler inoperative, substantially as shown and described.

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Witnesses:

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