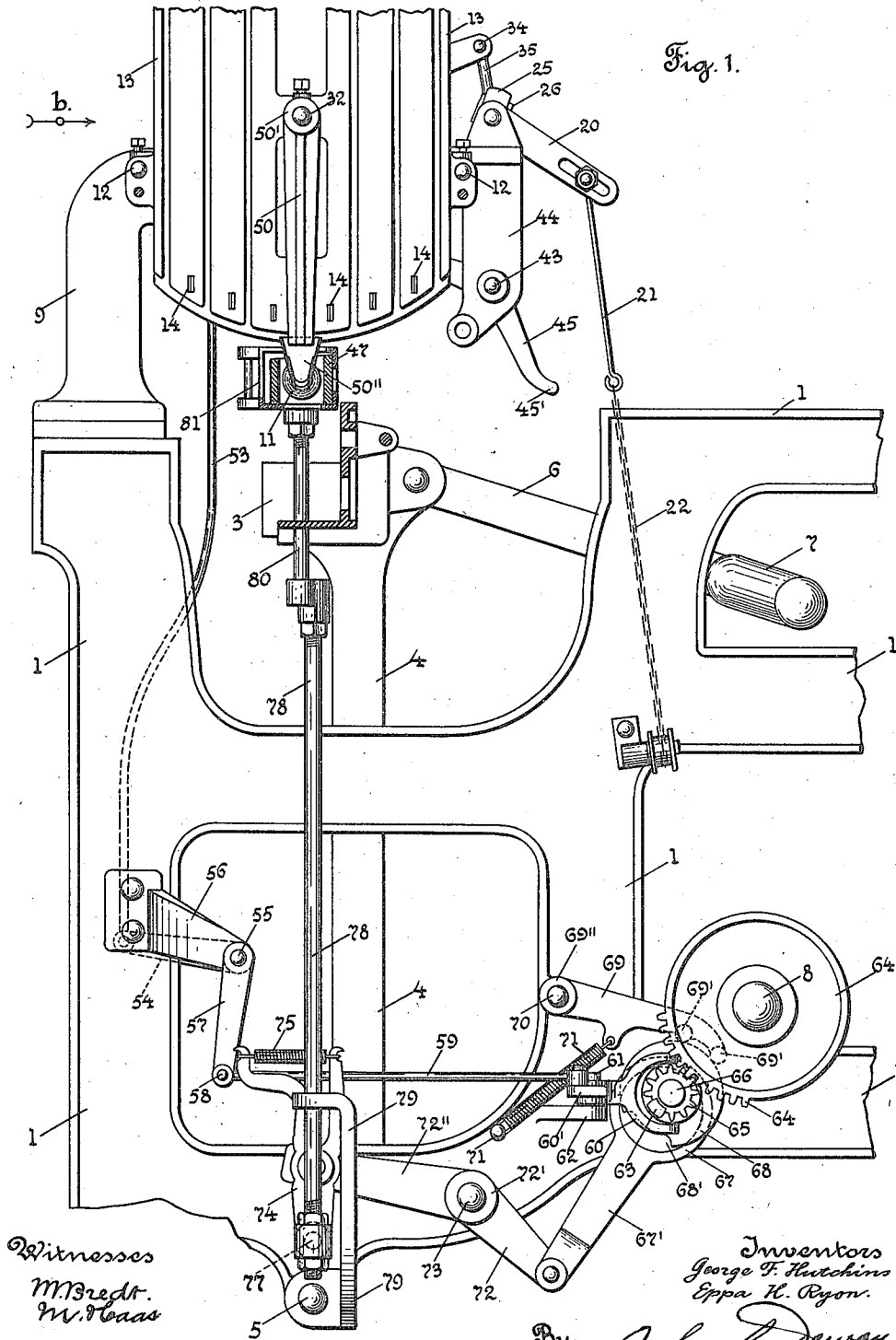


G. F. HUTCHINS & E. H. RYON.
WEFT REPLENISHING LOOM.
APPLICATION FILED NOV. 11, 1912.

1,221,802.

Patented Apr. 3, 1917.
3 SHEETS—SHEET 1.

Fig. 1.



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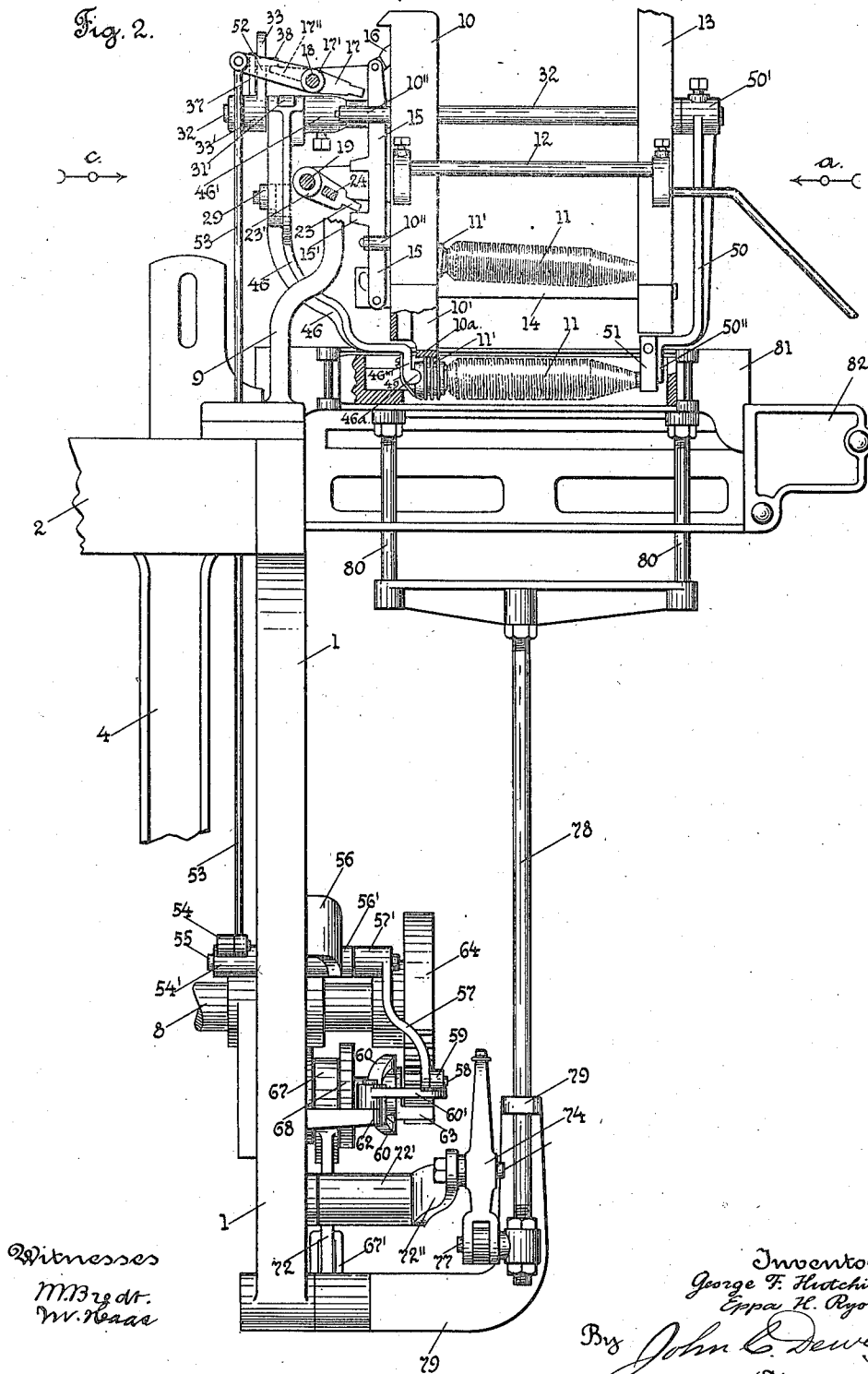
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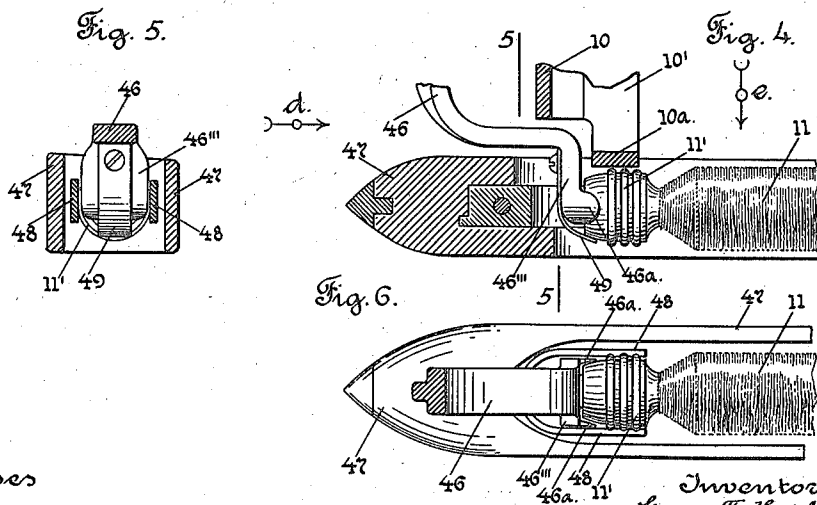
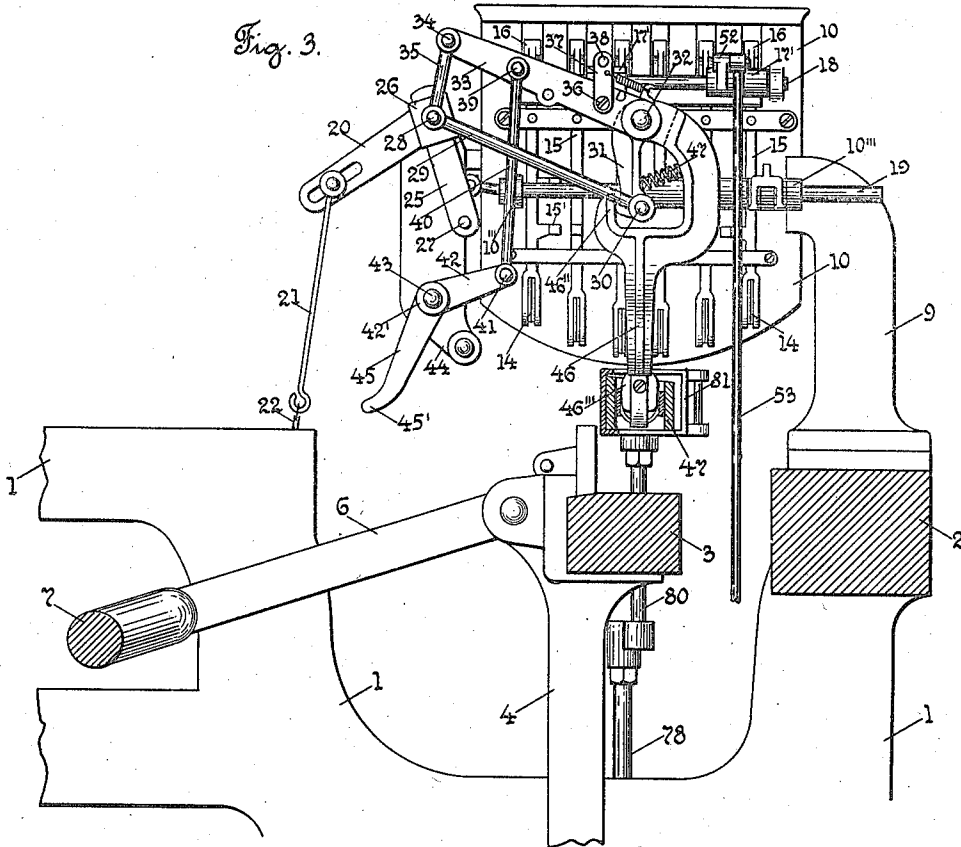


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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

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WEFT-REPLENISHING LOOM.

1,221,802.

Specification of Letters Patent.

Patented Apr. 3, 1917.

Application filed November 11, 1912. Serial No. 730,552.

To all whom it may concern:

Be it known that we, GEORGE F. HUTCHINS and EPPA H. RYON, citizens of the United States, residing, respectively, at Worcester, in the county of Worcester and State of Massachusetts, and Waltham, in the county of Middlesex and State of Massachusetts, have jointly invented certain new and useful Improvements in Weft-Replenishing Looms, of which the following is a specification.

Our invention relates to weft replenishing looms in which there are shifting shuttle boxes for a plurality of shuttles at one end of the loom, and a single shuttle box, and a stationary magazine at the other end of the loom, said magazine having a plurality of guide-ways or compartments for superposed bobbins or filling carriers of different color or character, corresponding to the color or character of the filling in the different shuttles upon an indication of the practical or substantial exhaustion of filling in the active shuttle. The selected bobbin or filling carrier is released from its guide-way or compartment in the stationary magazine to drop into a bobbin carrier or conveyer, which carries the bobbin above the stationary shuttle box on the lay, preparatory to being transferred into the active shuttle.

The stationary magazine, above referred to, is in this instance of the type shown and described in U. S. Letters Patent, No. 1,022,109, and in our present improvements we combine this stationary magazine with mechanisms on the loom for raising the single shuttle box, which carries the active shuttle, to receive the new bobbin direct from the conveyer of the stationary magazine, without using the transferrer arm ordinarily employed.

The mechanisms referred to for raising the shuttle box on the plain end of the lay, are in this instance of the type shown and described in U. S. Letters Patent, No. 935,645.

In the operation of the loom, when a change of filling is indicated, on the practical or substantial exhaustion of filling in the active shuttle, the bobbin, which has the same color or character of filling thereon as the bobbin in the active shuttle, will be

dropped from a compartment of the stationary magazine into the conveyer, and on the further movement of the releasing mechanism, the conveyer, with the released or dropped bobbin, will be moved to the center of the magazine and into a position above the shuttle box, when the lay has been moved to its front position. At the same time a lever on the stationary magazine is raised, and through intermediate connections, operates a sliding or starting tooth on a mutilated pinion, to move said sliding tooth into mesh with a mutilated gear on the bottom shaft of the loom, which causes said mutilated pinion to be revolved, and through an eccentric thereon, operate an angle lever, which is adapted to raise the single shuttle box on the lay, with the shuttle and the exhausted bobbin in the shuttle. The lower portion of the conveyer enters the active shuttle, and delivers a new bobbin to the same.

The raising and lowering of the single shuttle box on the lay is so timed, that its full operation will be accomplished in less than half the stroke of the lay.

Our invention consists in certain novel features of construction of our improvements, above referred to, as will be herein-after fully described.

We have shown in the drawing a detached portion of a stationary magazine of the type above referred to, with a shuttle box raising mechanism of the type above referred to, combined therewith, sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:—

Figure 1 is an end view of a loom frame, carrying a stationary magazine of the type above referred to, with the shuttle box operating mechanism supported thereon, looking in the direction of arrow *a*, Fig. 2. Some of the parts are shown in section.

Fig. 2 is a front view of the end of the loom, shown in Fig. 1, looking in the direction of arrow *b*, same figure. Some of the parts are shown in section.

Fig. 3 is an inner end view of the stationary magazine, looking in the direction of arrow *c*, Fig. 2. Some of the parts are shown in section.

Fig. 4 shows, on an enlarged scale, a sectional view of the butt end of the shuttle shown in Fig. 2, and the lower end of the conveyer arm, and the lower central portion of the magazine.

Fig. 5 is a section, on line 5, 5, Fig. 4, looking in the direction of arrow *d*, same figure, and,

Fig. 6 is a plan view of the shuttle shown in Fig. 4, looking in the direction of arrow *e*, same figure.

In the accompanying drawings, 1 is the loom side or end frame, 2 is the breast beam, 3 the lay, 4 the lay sword, pivotally mounted at its lower end at 5, see Fig. 1; 6 is the connector from the lay sword to the crank shaft 7, 8 is the bottom shaft of the loom, see Fig. 1. 9 is a stand secured to the breast beam 2 and loom side 1, which has rigidly connected thereto the inner end 10 of the stationary magazine, which has in this instance six vertically extending compartments or guide-ways 10', see Fig. 2, for the heads or butts 11' of the bobbins or filling carriers 11.

Carried on the transverse rods 12 is the outer end 13 of the stationary magazine, with six vertically extending compartments for the tips of the bobbins 11. Each compartment or guide-way is provided at its lower end with mechanisms for supporting the sets of bobbins therein, and also for releasing the lowest bobbin in each set, preparatory to being conveyed to the discharging center of the magazine, to be transferred into the active shuttle.

The holding and releasing means consists in this instance of sliding bars or blades 14, see Fig. 3, which are guided at each end thereof, and which blades, through the sliding movement communicated thereto, move from underneath the bobbins to release and drop the bobbins in the usual way.

On the inner side of the inner end 10 of the magazine, are six vertically moving bars 15, see Fig. 2, one for each compartment. These bars are loosely supported in guides 10'', and have an up and down movement therein. The bars 15 are provided at their upper ends with weighted hooks 16, which are adapted, on their downward movement, to communicate and rock the lever 17, which has its hub 17' secured on the rock shaft 18. Bearings 10''', see Fig. 3, on the magazine, have loosely mounted therein a longitudinally moving rod 19. A sliding motion is communicated to the rod 19, through angle lever 20, see Fig. 1, which, through a connector 21, and chain or cord 22 from the shifting shuttle boxes on the opposite end of the loom, not shown, receives a reciprocating movement, to cause the rod 19 to move longitudinally into six different positions, according to the position of the shifting shuttle boxes.

The longitudinally moving rod 19 has secured thereon, to move therewith, the hub 23', see Fig. 2, of an operating finger 23, to which is communicated a rocking motion through a lever 24, see Fig. 2, from the replenishing means, and intermediate connections thereon, not shown.

The rocking movement of the lever 24 will, through its engagement with the extension 15' on the vertically moving bar 15, move up or down a selected bar 15, and through the connection of each bar to the sliding blades 14, release and allow a bobbin 11 to drop from its compartment.

The operating lever 20, see Fig. 1, has an arm 25 rigidly connected thereto, which is adapted to loosely receive a sliding block 26, see Fig. 3, which in its normal position rests upon a pin 27 at the lower end of the arm 25. The block 26 carries a stud 28, which has pivotally connected thereto one end of the rod or connector 29; the other end of the connector 29 has pivotally connected thereto a stud 30, which is fast on the end of a downwardly extending arm 31, which has its hub 31' loosely mounted, in this instance on a transverse shaft 32, which is journaled in suitable bearings on the inner end 10 and outer end 13 of the magazine. Also loosely mounted on the shaft 32 is the hub 33' of an arm 33, which extends toward the rear of the magazine, and has its end, when in its lowered position, coincide with the axis or fulcrum of the arm 25. A stud 34 on the end of the arm 33, has pivotally connected thereto the upper end of the connector 35; the lower end of said connector 35 is connected to the stud 28 on the sliding block 26, see Fig. 3. A bolt or screw 36, on the arm 33, has loosely pivoted thereon the lower end of an upwardly extending latch 37. The upper end of the latch 37 has a pin 38 extending outwardly therefrom, and is adapted to be engaged by the arm 17'' on the lever 17, see Fig. 2, to move upwardly the arm 33, as shown.

A stud 39 on the arm 33 has pivotally connected thereto the upper end of a vertically extending connector 40; the lower end of said connector 40 is pivotally connected to a stud 41 on a lever 42, which has its hub 42' loosely mounted on a stud 43 on a stand 44. Extending rearwardly from the hub 42' is an arm 45 which has the engaging end 45', adapted to be engaged by the lay on its backward motion, to re-set and move downwardly the arm 33 to its inoperative position.

The arm or conveyer 46 is made in this instance of the shape shown in Figs. 2 and 3. The arm 46 has its hub 46', see Fig. 2, secured on the transverse shaft 32. An extension 46'', see Fig. 3, on the arm 46, engages the swinging lever 31. A helically coiled expansion spring 47 acts to yield-

ingly hold the conveyer arm 46 in engagement with the swinging arm 31, to move therewith when the arm 31 is operated as above described. The lower end of the conveyer arm 46 has the enlarged portion 46''', see Fig. 4, which is adapted to enter the shuttle 47 between the holding jaws 48, see Fig. 6, for the head 11' of the bobbin 11.

Extending lips 46^a on the end 46''', are provided to hold the head 11' of the bobbin 11, which is released from the magazine. A spring blade 49 is adapted to reach under the head of the bobbin, see Fig. 4, which spring yieldingly moves outwardly when a new bobbin is transferred into the shuttle, and the shuttle box moved downwardly.

The magazine end 10 is provided with an extension 10^a, see Fig. 4, at its central portion, to force the head of the bobbin 11 into the shuttle when it is raised, as will be hereinafter described.

The transverse shaft 32 has secured thereon, on its opposite end at the outer end frame 13 of the magazine, the hub 50', see Fig. 2, of a downwardly extending arm 50, which arm is adapted to carry at its lower end 50'', the tip of the released bobbin, see Figs. 1 and 2. Spring blades 51 are provided, which yieldingly hold the tip of the bobbin 11 in position.

We will now describe the mechanisms for raising the shuttle box which carries the shuttle, to receive a new bobbin from the conveyer, which mechanisms are similar to those shown and described in Letters Patent, No. 935,645, above referred to.

The rock shaft 18 on the magazine carries in this instance a lever or arm 52, see Figs. 2 and 3. The end of the lever 52 has pivotally connected thereto the upper end of a downwardly extending connector rod 53; the lower end of said connector rod 53 is pivotally connected to the end of a lever 54, see Fig. 2, which has its hub 54' fast on a short 55, which short shaft has a bearing 56' on a stand 56 secured to the loom frame. Also fast on the shaft 55 is the hub 57' of the lever 57. The end of said lever 57 carries a pin 58, to which is pivotally connected one end of a horizontally extending connector 59, see Fig. 1. The other end of the connector 59 is connected to an extension 60' on a yoke shaped lever 60, which is pivotally mounted on a stud 61 on an arm 62. The yoke shaped lever 60 is adapted to move a starting tooth 63, in or out of mesh with a mutilated gear 64, fast on the bottom shaft 8, to cause the rotation of a mutilated pinion 65. The mutilated pinion 65 is loosely mounted on a stud 66, and is connected with an eccentric 67, to turn said eccentric. Also connected with the pinion 65 is a disk 68, having a recessed portion 68' on its periphery, into which is adapted to extend the two rounded portions 69', in this instance on one

end of a lever 69, see Fig. 1. The hub 69'' of the lever 69 is pivotally mounted on a stud 70 on the loom frame 1.

A helically coiled contraction spring 71 is attached at one end to the lever 69, and at its other end to a stud 71' on the frame 1, and acts to yieldingly hold the rounded portions 69' toward the disk 68, to cause them to enter the recessed portion 68' of said disk 68, to lock the disk 67 in its inoperative position after it has made one full turn.

The eccentric 67 has an arm 67' thereon, which is pivotally connected with one arm of a lever 72, which has its hub 72' loosely mounted on a stud 73 on the frame 1. The other arm 72'' of the lever 72 is pivotally connected with a give-way device 74, which consists of two clamp arms, which are yieldingly held in engagement, by a contraction spring 75, with a stud 76 on the arm 72' of the lever 72. The clamp arms 74 are pivotally mounted at their lower ends on a stud 77, secured to the lower end of the box lifter rod 78. The box lifter rod 78 has a bearing in a stand 79, see Fig. 1, connected with the pivoted shaft or rod 5 of the lay sword 4, in the usual way. The upper end of the box lifter rod 78 carries a yoke shaped frame 80, which carries at its upper end a shuttle box or cell 81, to contain the active shuttle 47. The shuttle box 81 has a vertical movement, and is provided with projections which extend into guide-ways in the ends of the shuttle box guide frame 82, see Fig. 2.

By the raising of the shuttle box 81, the conveyer arms 46 and 50 enter the shuttle 47, and a new bobbin is inserted from the conveyer arms, and the spent bobbin 11 will pass through an opening in the shuttle in the usual way.

The mechanism for detecting the practical or substantial exhaustion of filling in the active shuttle, is not shown in the drawings or described herein, but may be of any usual construction, and connected with the weft replenishing mechanism to operate the same, and supply fresh filling on the substantial exhaustion of filling in the active shuttle.

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

Having thus described our invention, what we claim as new and desire to secure by Letters Patent is:—

1. In a weft replenishing loom, the combination with a stationary magazine, carrying bobbins, and a bobbin conveyer, movable under said magazine to receive a bobbin therefrom, and a portion of said conveyer adapted to enter the shuttle with a bobbin, and to move with the lay, of a vertically moving shuttle box, adapted to extend under said magazine, and carrying a shuttle having an opening therethrough, and means

for operating said shuttle box, to receive a bobbin from said conveyer.

2. In a weft replenishing loom, the combination with a stationary magazine, carrying bobbins, and a bobbin conveyer, movable under said magazine to receive a bobbin therefrom, and a portion of said conveyer adapted to enter the shuttle with a bobbin, and to move with the lay, and a yielding connection to said conveyer, of a vertically moving shuttle box, adapted to extend under said magazine, and carrying a shuttle having an opening therethrough, and means for operating said shuttle box, to receive a bobbin from said conveyer.

3. In a loom, a lay, a set of shifting shuttle boxes adapted to receive a plurality of shuttles containing filling carriers wound with distinctive filling, filling supplying mechanism adapted to contain filling carriers of distinctive or contrasting filling, said mechanism being under filling control to present fresh filling carriers one after another to complete exhaustion of said distinctive or contrasting filling carriers of at least one distinctive or contrasting character of filling of said filling supplying mechanism, combined with filling carrier replenishing mechanism for all of the filling carriers in said filling supplying mechanism, whereby to effect replenishment of all said plurality of shuttles, and including means to raise one of a plurality of shuttles at one side only of the loom from its operative position to an abnormal changing position, to effect at said side of the loom the substitution of a fresh filling carrier of the proper distinctive or contrasting filling pertaining to said raised running shuttle in place of the running filling carrier in said shuttle.

4. In a loom, a lay, a set of shifting shuttle boxes adapted to receive a plurality of shuttles containing filling carriers respectively wound with fillings of different color, filling supplying mechanism adapted to contain filling carriers of said different colors, said mechanism being under filling control to present fresh filling carriers one after another to complete exhaustion of all of said filling carriers of at least one color of filling of said filling supplying mechanism, combined with filling carrier replenishing mechanism for all of the said filling carriers in said filling supplying mechanism, whereby to effect replenishment of all said plurality of shuttles with appropriate colors therefor,

and including means to raise one of a plurality of shuttles at one side only of the loom from its operative position to an abnormal changing position, to effect at said side of the loom the substitution of a fresh filling carrier of the proper color of filling pertaining to said raised running shuttle in place of the running filling carrier in said shuttle.

5. In a drop box loom, in combination, a lay, plurality of shuttles carried by said lay, distinctive bobbins for each shuttle, means for holding said distinctive bobbins, said means being under filling control to present a fresh bobbin of the required kind at the transfer point upon substantial exhaustion of the running shuttle, and means for transferring each kind of bobbin to its particular shuttle, said means including mechanism to raise one shuttle at one side of the loom to an abnormal position to thereby replenish said shuttle.

6. In a drop box loom, in combination, a lay, a plurality of shuttles carried by said lay, distinctive bobbins for each shuttle, means for holding said distinctive bobbins, said means being under filling control to present a fresh bobbin of the required kind at the transfer point upon substantial exhaustion of the running shuttle, and means for transferring each kind of bobbin to its particular shuttle, said means including mechanism to raise said shuttles upon substantial exhaustion separately to an abnormal position to thereby replenish the raised shuttle.

7. In a drop box loom, in combination, a lay, a plurality of shuttles carried by said lay, distinctive bobbins for each shuttle, means for holding said distinctive bobbins, said means being under filling control to present a fresh bobbin of the required kind at the transfer point upon substantial exhaustion of the running shuttle, and means for transferring each kind of bobbin to its particular shuttle, said means including mechanism to raise said shuttle to an abnormal position after presentation of the required bobbin at the transfer point, the raising of said shuttle effecting replenishment thereof.

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Witnesses:

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