

(No Model.)

R. B. GOODYEAR.  
SHUTTLE BOX MOTION FOR LOOMS.

No. 419,435.

Patented Jan. 14, 1890.

Fig. 1.

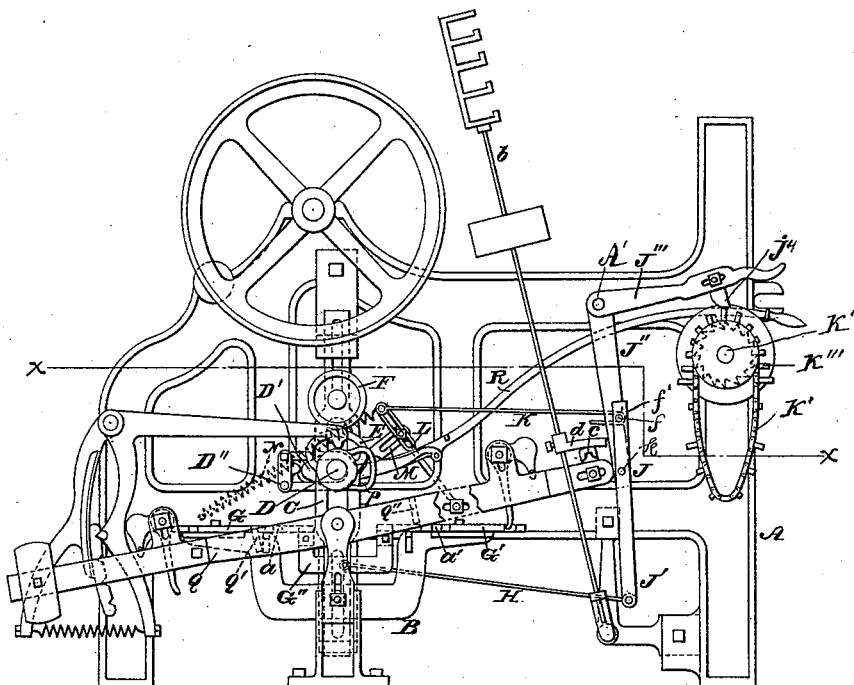


Fig. 2.

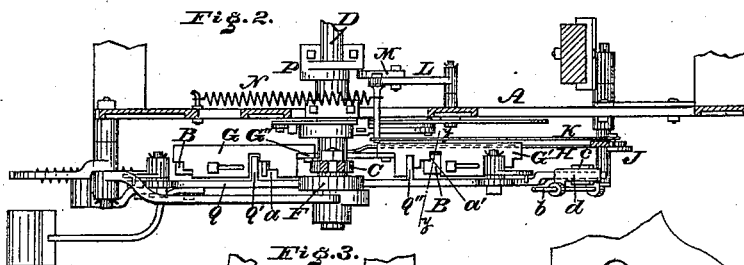


Fig. 3.

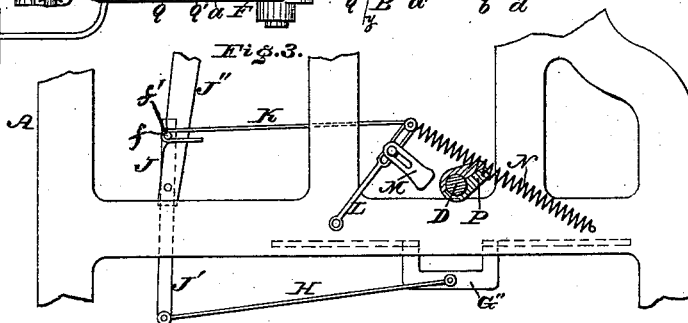
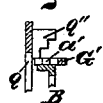


Fig. 4.



WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## SHUTTLE-BOX MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 419,435, dated January 14, 1890.

Application filed April 21, 1884. Serial No. 128,704. (No model.)

*To all whom it may concern:*

Be it known that I, ROBERT B. GOODYEAR, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Shuttle-Box Motions for Looms, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a side elevation of a portion of a loom embodying my invention. Fig. 2 is a horizontal section in line *xx*, Fig. 1. Fig. 3 is a side elevation of a portion of the devices shown in Fig. 1 and viewed in an opposite direction. Fig. 4 is a section in line *yy*, Fig. 2.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of an improvement in shuttle-box motions for looms by which the boxes are rapidly moved to the desired position without abruptness or jerking, as will be hereinafter fully set forth.

It also consists of mechanism, as described and claimed, whereby the slides of the anchor are shifted thereon.

It further consists of the combination and arrangements of parts, as herein set forth and claimed.

Referring to the drawings, A represents the frame of a loom, on which are mounted the ordinary operating parts or mechanism thereof, which will be referred to hereinafter so far as the said parts may be connected with the parts claimed as new.

B is an anchor secured to a rising and falling yoke C, which is operated by the rotary shaft D by means of the cam E on said shaft and the roller or stud F on the yoke.

Mounted on the anchor B are slides G G', connected by the U-shaped piece G'' for the purpose of causing them to move laterally and in unison on the said anchor. These slides are provided with step-shaped recesses *aa'*, for a purpose hereinafter set forth. The piece G'' has pivotally secured to it a rod H, which latter is also pivotally connected to the lower part J' of the vertical jointed arm J, the said arm also having an upper part J'', which is pivotally connected at its lower end to the said lower part J'. On the inner side

of the part J', and at the upper portion thereof, is a pin *f*, (see Fig. 3,) adapted to engage in a notch or recess *f'* on the lower portion of the part J'', when the said parts J' and J'' are in a right line. The upper end of the part J'' is pivotally secured to the frame A, and has rigidly attached to it the horizontal arm J''', provided with an adjustable projection *g''*, resting upon the pins of the pattern-chain K', which latter is of the usual construction, being supported on a drum attached to the side of the ratchet-wheel K'', mounted on the shaft K'', the latter being suitably journaled in the frame of the machine, and the drum receiving motion by means of an oscillating pawl-bar R, properly connected to the shaft D. The said connection may consist of an eccentric or cam D', rigidly secured to the shaft D, and a yoke D'', connected to the bar R, the yoke being mounted on said eccentric or cam, and so causing the bar to be operated by the revolution of the cam on the shaft. The outer end of the bar carries a pawl which engages with the ratchet-wheel K'', thus rotating the said wheel and with it the drum and pattern-chain.

A rod K, having a hooked end adapted to bear on the pin *f*, is connected to an arm L, which is pivotally attached at its lower end to the frame A, (see Fig. 3,) and is provided with a nose M. Both the said arm L and nose M at its upper end are slotted, so as to permit an adjustable connection of the said parts. Controlling the arm L are a spring N and a cam P, the spring being secured at one end to the upper end of the said arm L and at the other end to the frame of the machine, and the cam P being secured on the shaft and adapted to bear against the nose M, so as to raise the upper end of said arm L.

Q is an anchor-lever, on which are cast or secured step-shaped lugs Q' Q'', which are adapted to enter the step-shaped recesses *aa'* of the slides G G', it being noticed that the said slides and lugs are arranged and move at a right angle to each other.

The operation is as follows: Motion is imparted to the shaft D in any suitable manner, and the anchor B and consequently the slides G G' are thereby moved in a vertical direction.

As the pattern-chain presents its different pins to the projection  $j''$  of the arm  $J'''$ , it will be seen that the arm  $J'''$  and part  $J''$ , forming a lever pivoted at  $A'$  in the frame  $A$ , will be moved proportionally to the height of the pins, and that the lower end of the said part  $J''$  will be moved either to the right or left, according to whether the boxes are to be raised or lowered. The parts of the loom are so timed that as the pin of the pattern-chain engages the projection  $j''$  the cam  $P$  is released from the nose  $M$ , so that the spring  $N$  is free to act. If the boxes are to be raised, a higher pin than the one preceding it is presented to the pawl  $j''$ , and the outer end of the part  $J'''$  is raised and the part  $J''$  is swung or moved to the right, the spring  $N$  being extended, so as to permit the upper end of the part  $J'$  to move to the right, thereby drawing the rod  $H$  and the connecting-piece  $G''$  with the slides  $G$   $G'$ , so that the recesses  $a$   $a'$  of said slides are brought into the required position for engagement with the lugs  $Q'$   $Q''$  of the anchor-lever  $Q$ . If the boxes are to be lowered, a lower pin than the one preceding it is presented to the pawl  $j''$ , the outer end of the part  $J'''$  is lowered, and the part  $J''$  is swung or moved to the left. At the same time, owing to the nose  $M$  being released from the cam  $P$ , the spring  $N$  draws the rod  $K$ , so that the pin  $F$  is kept in the recess  $f'$ , and the lower end of arm  $J'$  is moved to the left with the rod  $H$  and the connecting-piece  $G''$  with the slides. By these means the said anchor-lever  $Q$  is moved through the desired arc, and the rod  $b$ , carrying the shuttle-boxes, is raised or lowered as desired, movement being communicated to the rod by a cam  $c$  on the anchor-lever  $Q$  and a nose  $d$  on the rod  $b$ . Owing to the employment of the jointed arm  $J$ , the movements of the rod  $H$ , connected with the lower section of said arm, and consequently the movements of the connecting-piece  $G''$  and the slides, are not entirely accomplished by the pins of the pattern-chain raising the arm  $J'''$  and swinging the part  $J''$ , but are aided by the action of the spring  $N$ . By this means a great measure of the pressure on the pins is avoided, and consequently the rapid wearing thereof is prevented.

It will be seen that during the operation of the spring  $N$  and other parts operating the slides the part  $J''$  and arm  $J'''$  remain at rest, owing to the projection  $j''$  being in contact with and resting on a pin of the pattern-chain.

What I desire to claim and secure by Letters Patent is—

1. The anchor  $B$ , with mechanism, substantially as described, for imparting a rising-and-falling motion thereto, in combination with the anchor-lever  $Q$ , having lugs  $Q'$   $Q''$ , a rod actuated thereby and carrying shuttle-boxes, the slides  $G$   $G'$ , with connecting-piece  $G''$ , the rod  $H$ , connected to said piece  $G''$ , the arm  $J$ , consisting of the parts  $J'$ , with pin  $f$ , and the part  $J''$ , with recess  $f'$ , the horizontal arm  $J'''$ , with projection  $j''$ , a pattern-chain with pins, the rod  $K$ , with hooked end adapted to engage the pin  $f$ , the arm  $L$ , having nose  $M$ , the spring  $N$ , and a driving-shaft and cam, substantially as and for the purpose set forth.

2. The anchor  $B$ , having slides  $G$  and  $G'$  mounted thereon, the said slides having a connecting-piece  $G''$ , in combination with the connecting-rod  $H$ , the arm  $J$ , composed of the pivoted parts  $J'$  and  $J''$ , the part  $J'$  having pin  $f$ , the arm  $L$ , having the nose  $M$ , the cam  $P$ , the rod  $K$ , having a hook end, the horizontal arm  $J'''$ , the spring  $N$ , a pattern-chain, and devices for operating said chain, substantially as described.

3. The shaft  $D$ , having cam  $P$ , in combination with the arm  $L$ , having nose  $M$ , the spring  $N$ , the rod  $K$ , and the jointed arm  $J$ , composed of parts  $J'$ , having pin  $f$ , and part  $J''$ , having notch  $f'$ , the horizontal arm  $J'''$ , having projection  $j''$ , the slides  $G$   $G'$ , with connecting-piece  $G''$ , the rod  $H$ , a pattern-chain with pins, and means for rotating said chain, substantially as described.

4. A driving-shaft with cam thereon, in combination with a pivoted arm having a nose, a spring controlling said arm, a rod connected to said arm and having a hooked end, a pattern-chain with pins and devices for rotating the same, a vertical jointed arm having connected with the upper part thereof a horizontal arm with projection adapted to rest on the pins of said pattern-chain, the lower part of said jointed arm having a pin adapted to be engaged by said hooked end of the rod, an anchor-lever, an anchor with slides for throwing said anchor-lever, and means for connecting said slides to said lower part of the jointed arm, substantially as and for the purpose set forth.

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Witnesses:

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