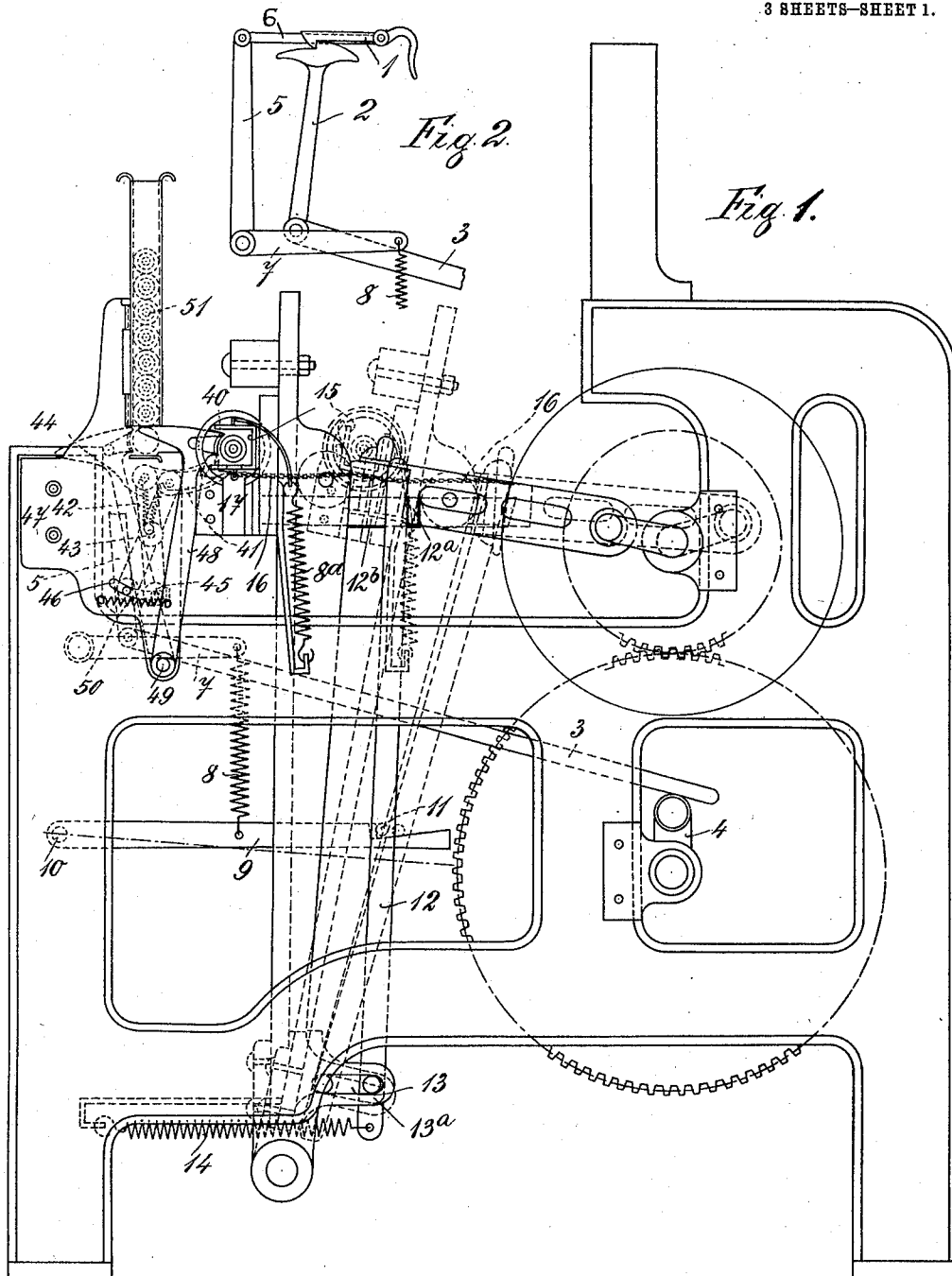


J. GABLER.
 AUTOMATIC REFILLING DEVICE FOR LOOM SHUTTLES.
 APPLICATION FILED SEPT. 27, 1910.

1,005,017.

Patented Oct. 3, 1911.

3 SHEETS—SHEET 1.



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Inventor:
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3 SHEETS—SHEET 2.

Fig. 3

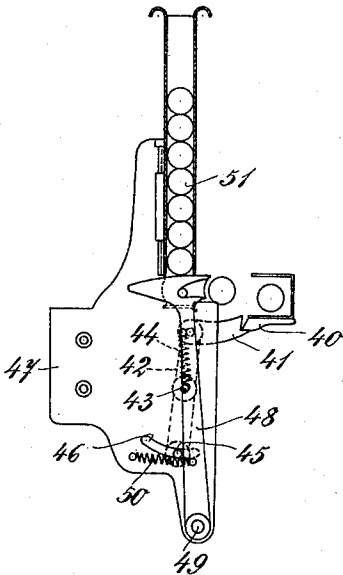


Fig. 4

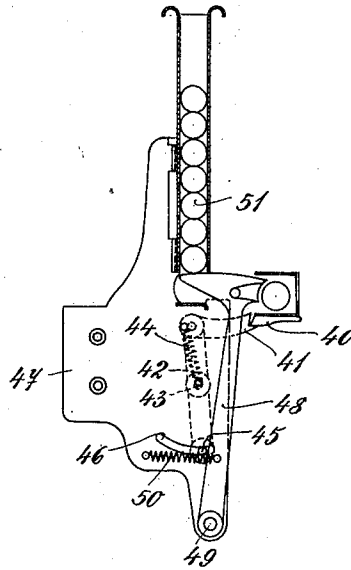
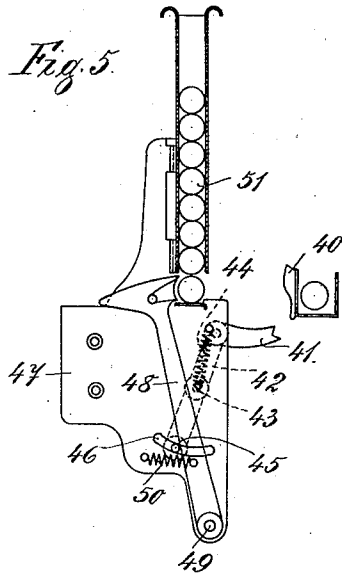


Fig. 5



Witnesses:
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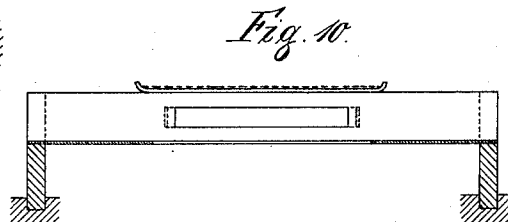
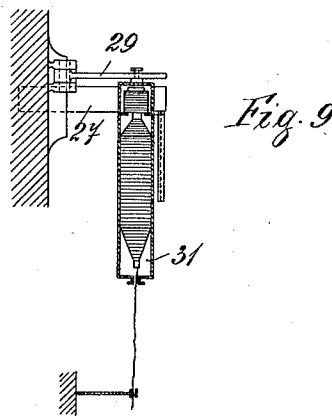
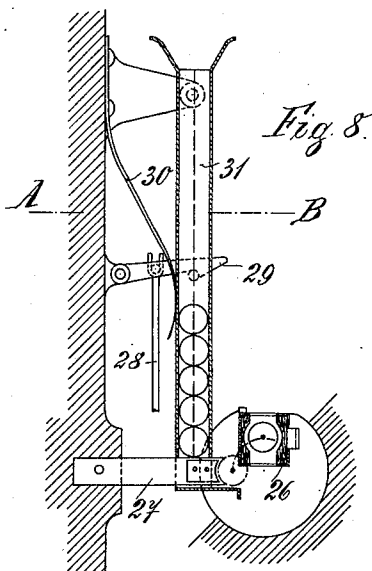
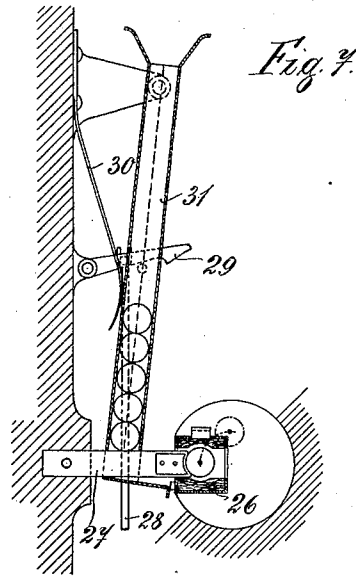
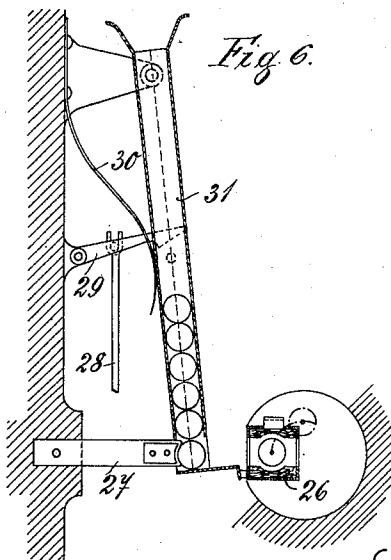
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3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

JOHANNES GABLER, OF ISSELHORST, GERMANY, ASSIGNOR OF ONE-HALF TO
BERNHARD ELMENDORF, OF ISSELHORST, GERMANY.

AUTOMATIC REFILLING DEVICE FOR LOOM-SHUTTLES.

1,005,017.

Specification of Letters Patent.

Patented Oct. 3, 1911.

Application filed September 27, 1910. Serial No. 584,058.

To all whom it may concern:

Be it known that I, JOHANNES GABLER, a subject of the King of Prussia, and resident of Isselhorst, Westphalia, in the German Empire, have invented certain new and useful Improvements Relating to Automatic Refilling Devices for Loom-Shuttles, of which the following is a specification.

This invention relates to improved automatic mechanism for refilling the shuttle of a loom with a fresh cop or bobbin, taken from a magazine.

The object of the present invention is to provide simple mechanism which will reliably effect such automatic refilling.

According to the present invention the shuttle box is rotatably mounted in a frame or casing fixed to the lay and, when a refill is required, is rotated automatically through an angle of say 90° so that the opening of the shuttle comes opposite a fresh cop or bobbin. In this way as the lay approaches its extreme forward position it presses the fresh cop or bobbin into the shuttle and simultaneously ejects the empty one rearwardly.

The invention is illustrated in two forms by way of example in the accompanying drawings which form part of this specification.

In these drawings: Figure 1 is a side view illustrating the invention in one form; the shedding mechanism has been omitted to avoid complication and the picking mechanism is only indicated in so far as is necessary to show the operation of this invention. Fig. 2 is a partial view looking at the opposite side of the loom to Fig. 1 and shows the weft fork and its co-acting parts. Figs. 3 and 4 are diagrammatic sectional elevations showing different coöperating positions of the pusher and shuttle box during changing of the cop or bobbin. Fig. 5 is a view similar to Figs. 3 and 4 showing the position of the parts after the new cop or bobbin has been inserted and the shuttle-box has returned into its normal working position. Figs. 6, 7 and 8 are views similar to Figs. 3, 4 and 5 showing a modified form in which the magazine with the cop or bobbins is movable and the pusher is fixed. Fig. 9 is a section on the line A B of Fig. 8 and Fig. 10 is a longitudinal section of the

shuttle box showing the box supported eccentrically in its frame.

In carrying the invention into effect according to the form shown, the weft fork 1, which is shown separately in Fig. 2 as it is arranged on the opposite side of the loom to the mechanism hereinafter described, when it is no longer raised by the weft thread, as happens when the weft thread breaks or the bobbin in the shuttle is empty, engages in the nose of the lever 2 which is oscillated backward and forward by its arm 3 coöperating with the cam 4 (see Fig. 1). In this way the weft fork is moved to the left and the rod 6 oscillates the lever 5 which is pivoted to the frame of the loom. The arm 7 of the lever 5 is articulated by the spring 8 to the lever 9 which is pivoted to the loom frame at 10. The lever 9 has a nose piece on its free end adapted to engage with a pin 11 on a floating lever 12 only when the lever 9 has been raised by the pull on the spring 8. The lever 12 is mounted on and normally moves with the sword. A side piece 13^a on the sword is provided with a slot 13 in which there slides a pin fixed to the floating lever 12. The lower end of the floating lever 12 is held by a spring 14 so that the pin is held against the left hand end of the slot 13 in Fig. 1. The upper end of the floating lever 12 is connected by a band or chain 16 to the shuttle box 15, which is rotatably and centrally mounted on the bracket or frame 17 carried by the lay. The shuttle box 15 is also connected by a band or chain to the spring 8^a. The shuttle box 15 is provided with a projecting lug 40 which, on the shuttle box being rotated through about 90° as described hereafter, comes into the path of a pawl 41 carried by a lever 42, pivoted at 43. The pawl 41 is held in the approximately horizontal position shown by means of a spring 44. The other end of the lever 42 carries a pin 45 which passes through a curved slot 46 in the plate 47 on which the magazine and the lever 42 are mounted. The plate 47 is fixed alongside the breast beam of the loom. The pin 45 engages in front of a lever 48 pivoted at 49 and normally held to the extreme left against the pin 45 by means of a spring 50. The upper end of the lever 49 is provided with a concave end adapted when the

lever is moved clockwise to engage the lowest cop or bobbin in the magazine 51 and carry it forward to insert it in the shuttle, after which the lever 48 is withdrawn by its spring 50.

When the weft thread breaks or a cop or bobbin is empty it will be seen that the floating lever which oscillates with the sword will be held up by the stop lever 9 coacting with the pin 11 and pivot about its pin in the slot 13. In this way the band 16 or the like will be pulled and the shuttle box rotated through an angle of approximately 90° until the upper end of the floating lever strikes against a stop 12^a carried by a bar 12^b fixed on the lay. At the same time the spring 8^a will be stretched. As the oscillating movement of the sword continues the lower end of the floating lever will slide in its slot 13 and stretch the spring 14. The rotation of the shuttle box 15 brings the opening in the same together with the shuttle opposite the cop or bobbin which has been pushed forward by the pusher lever 48. It will be seen that during ordinary operation the pawl 41 clears the lay 40 but when the shuttle box 15 is rotated the pawl is moved to the left in Fig. 1, thus oscillating the lever 42 in a counterclockwise direction. This causes the pin 45 to push the pusher lever 48 in a clockwise direction against the action of its spring 50. The pusher 48 moves with such speed that the cop or bobbin is sufficiently held in its concave end to prevent it falling out in the short distance between the bottom tray of the magazine and the shuttle. When the lay starts its return motion the spring 8^a first draws the shuttle box 15 back into its normal working position (Fig. 5) and the spring 14 returns the floating lever 12 into its normal position. The weft fork 1 will be raised by the weft thread as usual and the levers 5, 7 and 9 rendered inoperative so that the nose on the lever 9 will not engage the pin 11 on the floating lever 12.

Referring to the modification shown in Figs. 6-10: In this form two departures are made from the form shown in Figs. 1-5. In the first place the magazine 31 is rotatably suspended and the pusher 27 is stationary. The magazine is, under the action of a spring 30, pressed to the right in Figs. 6-8 but is restrained by a catch pawl 29 which is operated by the rod 28. The rod 28 takes the place of the rod 19 in Fig. 1. When therefore a thread breaks or the shuttle requires a refill the rod 28 raises the catch 29 and liberates the magazine, which then swing outward (see Fig. 6). In this position the new cop or bobbin comes into the path of the opening in the shuttle which has been rotated in the manner herein-after described. The latter part of the oscillating movement of the lay effect-

pushing in of the new cop or bobbin by co-acting with the fixed pusher 27 (see Fig. 9). When the lay returns on its path the shuttle box is rotated back through about 90° into its working position and the magazine again returns to its normal position in which the catch 29 restrains the spring 30 (see Fig. 8).

In the form described above with reference to Figs. 1-4 the shuttle box is supported centrally within the frame or bracket 17, so that the box rotates about its longitudinal axis. In the form shown in Figs. 6-10 the shuttle box 26 is supported eccentrically in the frame, so that when rotation takes place the box takes up a position in front of its normal extreme forward position. In this way the fixed stop 27 effectively coöperates with the oscillating lay to push the new cop or bobbin into the shuttle.

In the forms described the cop or bobbin is pushed into the shuttle wholly by the motion of the lay while the pusher remains stationary during insertion. If desired however the pusher may be arranged to assist the actual insertion by moving toward the shuttle during the latter part of the forward oscillating movement of the lay.

By means of this invention the following advantages are obtained. (a) As the latter part of the oscillating movement of the lay is utilized for pushing in the refill, a comparatively long period is available for the operation and thereby the correct insertion of the cop or bobbin is rendered much more reliable. (b) As the cop or bobbin enters the shuttle, in the direction of the curved oscillating path imparted to the shuttle by the lay, shuttles of very small cross section may be employed and thus easier operation is obtained on account of the smaller weight of shuttle box required. (c) During the normal weaving operation, the shuttle follows its ordinary path in the loom and is only rotated temporarily into position to receive the new bobbin or cop when such is required. (d) The entire mechanism hereinbefore described may be readily applied to existing looms with either over or under-pick-motion without entailing great cost.

I claim:

1. In combination with the lay of a loom, a shuttle, a rotatably mounted shuttle box carried by the lay, a weft fork, a magazine for refills for the shuttle, means rendered operative by the operation of the weft fork for rotating said shuttle box and inserting a fresh refill into said shuttle and means for thereafter rotating said shuttle box in the reverse direction to normal position.

2. In combination with the lay of a loom, a shuttle, a rotatably mounted shuttle box carried by the lay, means for rotating said shuttle box about 90° when required to place a refill into the shuttle, said rotation taking

place before the lay reaches the extreme forward part of its motion, means for placing a refill in the shuttle after said rotation and means for thereafter rotating said shuttle box in the reverse direction to normal position.

3. An automatic shuttle refilling device having a rotatable shuttle box carried by the lay, means for temporarily rotating said box through a desired angle when a refill is required, said means comprising a floating lever flexibly connected with the shuttle box, means for limiting the rotation of said box to the desired angle, and means for returning said box to normal position after the refill has been inserted.

4. An automatic shuttle refilling device for looms comprising in combination with a rotatable shuttle box, a pusher lever, means for rotating the shuttle box in one direction, means coacting with the shuttle box for actuating the pusher lever, and means for thereafter rotating the shuttle box in the reverse direction to normal position.

5. An automatic shuttle refilling device for looms comprising in combination with the lay, a shuttle box rotatably mounted on said lay, means for rotating said shuttle box in one direction when a refill is required, a magazine for refills, a pusher lever adapted to co-act with the lowest refill in said magazine, means co-acting with the shuttle box when rotated for actuating said pusher and means for thereafter rotating the shuttle box in the reverse direction to normal position.

6. An automatic shuttle refilling device for looms comprising in combination with the lay, a shuttle box rotatably mounted on said lay, means for rotating said shuttle in

one direction when a refill is required, a magazine for refills, a pusher lever, a head on said lever having a concave end adapted to co-act with the lowest refill in said magazine, means co-acting with the shuttle box when rotated for actuating said pusher and means for thereafter rotating the shuttle box in the reverse direction to normal position.

7. In combination with the lay of a loom, a sword carrying said lay, a floating lever mounted parallel to said sword, a slotted arm on said sword, a pin on said floating lever engaging in said slot, a spring holding the end of said floating lever, a rotatable shuttle box, a flexible connection from one end of said floating lever to said shuttle box, a pin midway on said floating lever, means engaging said pin for arresting the motion of said lever, and spring means for returning the shuttle box to its normal position after replenishment of the shuttle.

8. In combination with the lay of a loom, a shuttle, a rotatably mounted shuttle box carried by the lay, a weft fork, a magazine for refills for the shuttle, means rendered operative by the operation of the weft fork for rotating said shuttle box, so as to rotate the shuttle about its longitudinal axis, means for inserting a fresh refill into said shuttle and means for thereafter rotating said shuttle box and shuttle in the reverse direction to normal position.

In witness whereof I have hereunto set my hand in the presence of two witnesses.

JOHANNES GABLER.

Witnesses:

J. W. LIMBRINK,
RICHARD SCHUMANN.