

J. ROSTRON.
WEFT CONTROLLING MECHANISM FOR WEAVING LOOMS.
APPLICATION FILED JULY 15, 1907.

938,276.

Patented Oct. 26, 1909.

5 SHEETS—SHEET 1.

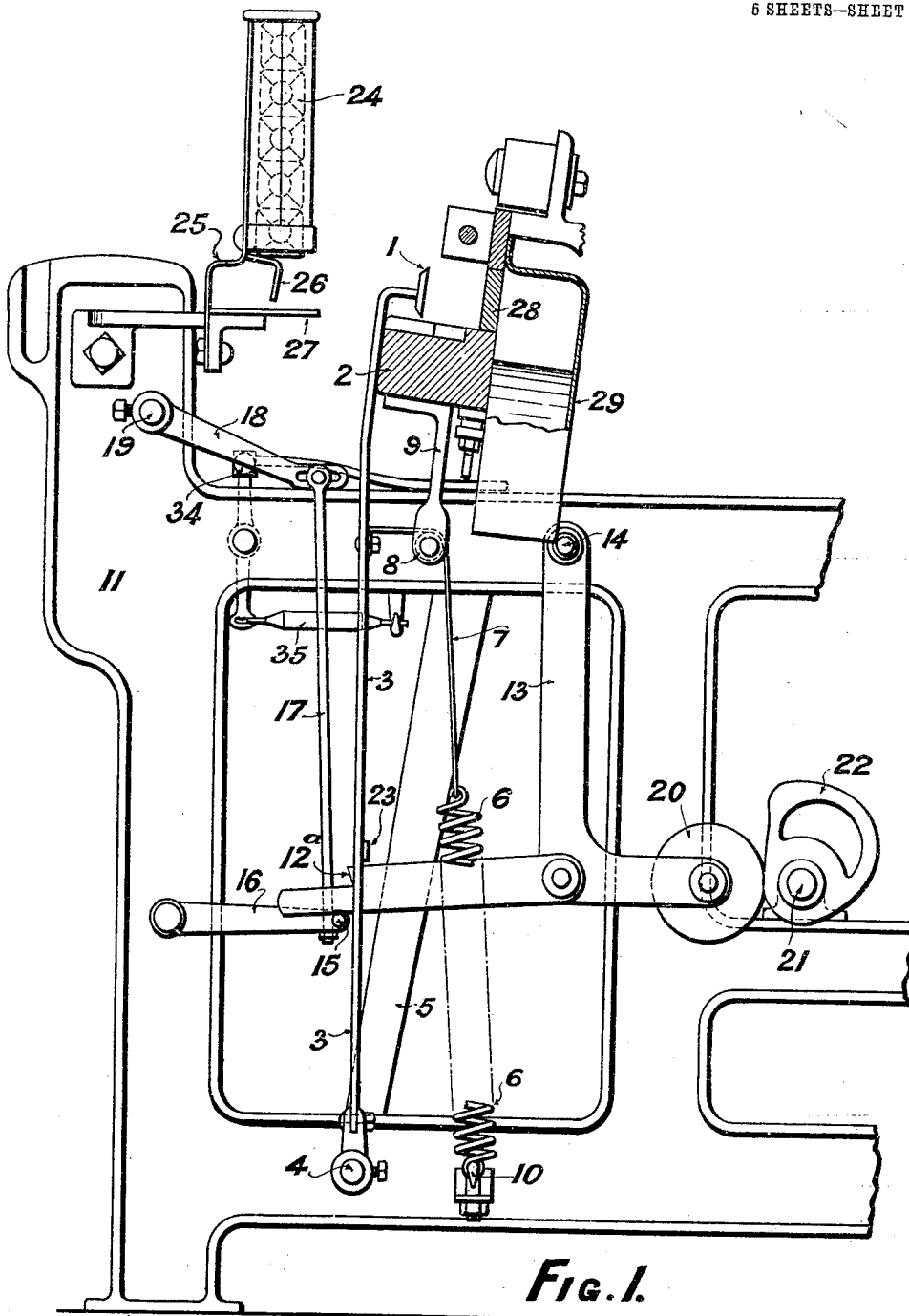


Fig. 1.

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By his Attorney Walter Luron.

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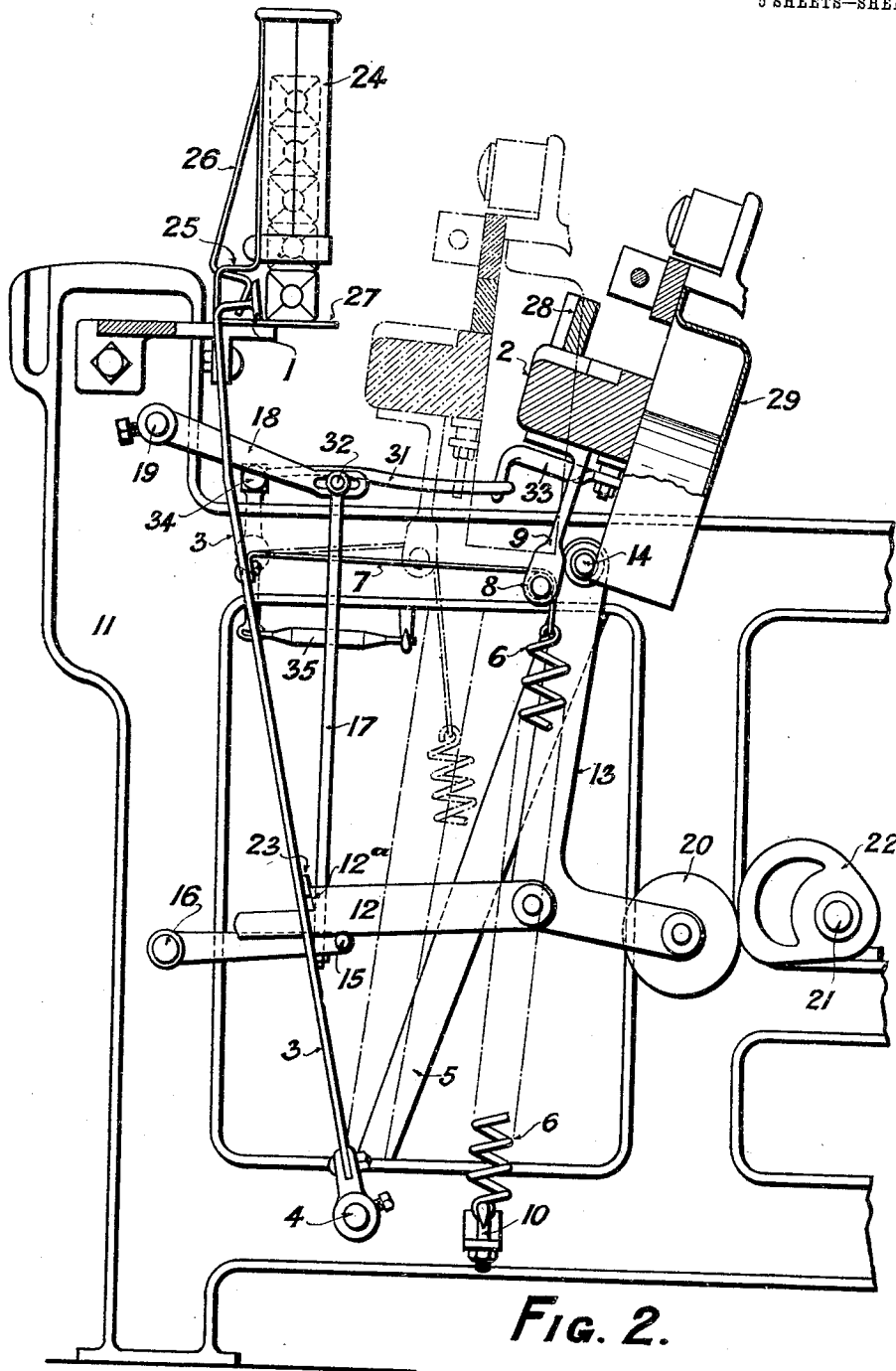


FIG. 2.

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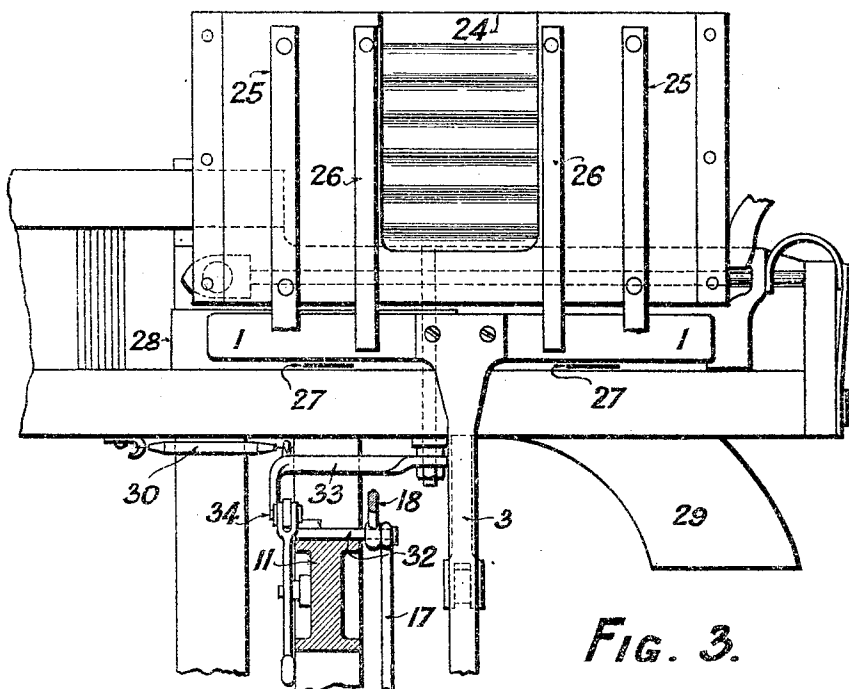


FIG. 3.

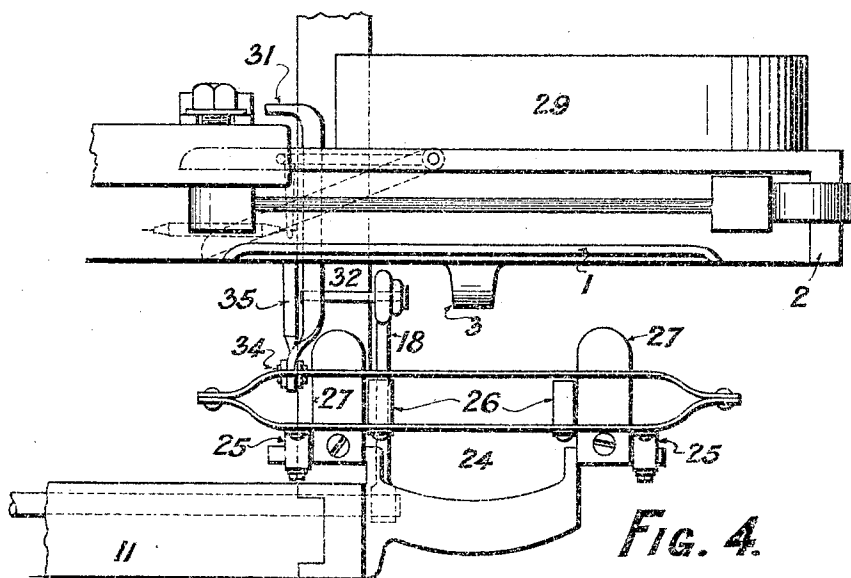


FIG. 4.

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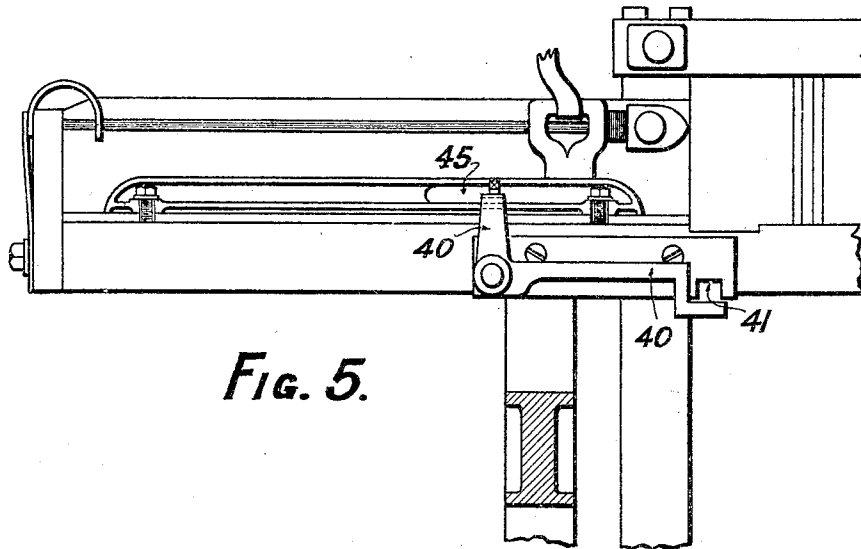


FIG. 5.

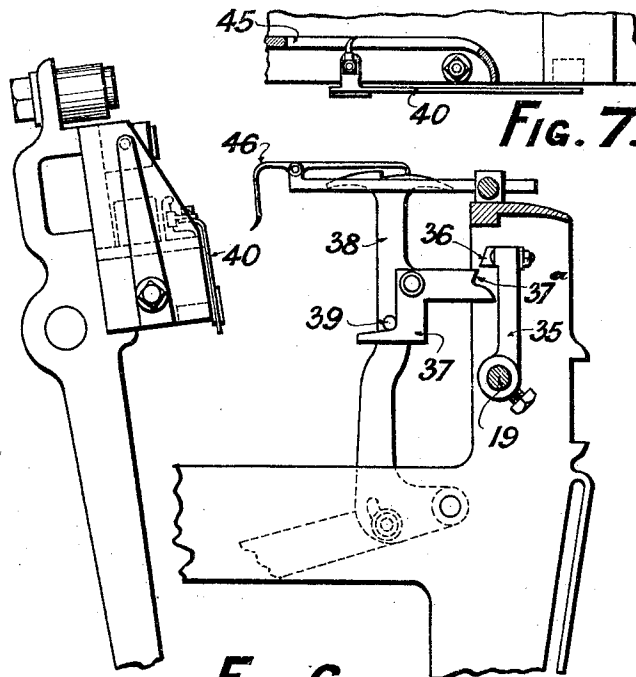


FIG. 7.

FIG. 6.

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5 SHEETS—SHEET 5.

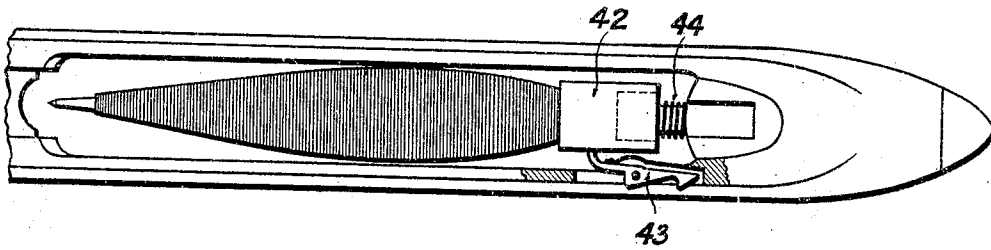


Fig. 8.

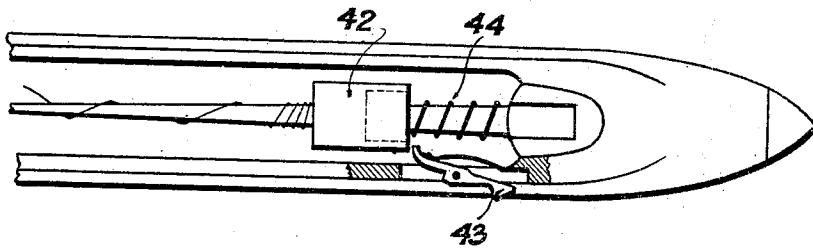


Fig. 9.

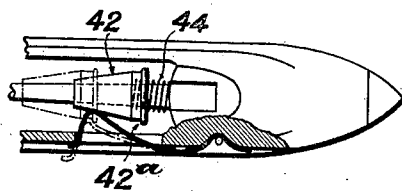


Fig. 10.

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UNITED STATES PATENT OFFICE.

JAMES ROSTRON, OF BRADFORD, MANCHESTER, ENGLAND.

WEFT-CONTROLLING MECHANISM FOR WEAVING-LOOMS.

938,276.

Specification of Letters Patent.

Patented Oct. 26, 1909.

Application filed July 15, 1907. Serial No. 383,825.

To all whom it may concern:

Be it known that I, JAMES ROSTRON, a subject of the King of Great Britain and Ireland, and resident of Bradford, Manchester, England, have invented certain new or Improved Weft-Controlling Mechanism for Weaving-Looms, of which the following is a specification.

This invention refers to and consists of an improved combination and arrangement of mechanism for automatically introducing a newly-filled shuttle into the shuttle-box of a loom when the weft in the working shuttle fails or breaks, the object of the invention being primarily to effect the insertion of the newly filled shuttle without the impact and noise hitherto present in known mechanism of this kind, and secondly, to simplify the working parts.

Upon the accompanying drawing, Figure 1 illustrates a side elevation of the right-hand end of an ordinary calico loom (in part) with the improved replenishing apparatus applied thereto, the parts being shown in the positions they occupy when there is a supply of weft in the working shuttle. Fig. 2 illustrates another side elevation of the same end of the loom but with the parts in the positions they occupy when a newly-filled shuttle is being inserted (or is about to be inserted) in the shuttle-box. Fig. 3 illustrates a front view (partly sectional) and Fig. 4 a plan of the same end (in part) of the said loom. Fig. 5 illustrates a front view (in part and partly sectional), and Fig. 6 a side elevation of the left hand end of the loom (also partly sectional). Figs. 7, 8 and 9 illustrate plans of certain parts by which the replenishing apparatus is controlled. Fig. 10 illustrates a modification.

Referring now to Figs. 1 to 4, the front of the right-hand shuttle-box is made free and independent of the slay 2, and such box front is secured at the upper end of a long lever-arm 3 mounted upon the axis 4 of the slay-sword 5. Under the force of a strong spring 6 the lever-arm 3 yieldingly holds the shuttle-box front 1 in its usual position. The spring 6 will preferably act upon the lever arm 3 through a flexible band 7 working over a runner 8 carried by a depending bracket 9 on the underface of the slay, and the position of the fixed hook 10 to which the spring is secured will be near to the axis 4 of the slay-sword so that in ordinary work-

ing the spring shall offer little or no resistance to the movements of the slay.

Suspended horizontally alongside the loom frame 11 is a notched bar 12 one end of which is loosely connected to a pendulous L-shaped lever-arm 13 pivotally connected to the loom frame at 14, while the other end of the notched bar is supported by a stud 15 on a lever-arm 16 and by a link or rod 17 which in turn, is supported by a lever-arm or finger 18 mounted upon a revolvably mounted rod 19 extending across the loom. Also rotatably carried by the lever-arm 13 is a roller 20. Upon say the tappet-shaft 21 of the loom is a cam 22 and under the gravity of the lever-arm 13 the roller 20 is caused to lie against the periphery of the cam as shown.

Under the rotary movements of the cam the notched bar 12 is given a constant to-and-fro horizontal motion.

Upon the lever-arm 3, and in the plane of the notched bar 12 is a small lateral projection 23.

Until the weft in the working shuttle is exhausted the finger or lever-arm 18 remains in its lowest position and this holds the notched bar 12 below and clear of the projection 23. When, however, the weft fails (or is broken) and the weft-controlling mechanism (hereinafter more fully described) comes into action and the finger or arm 18 is thereby raised, the notched bar 12 is also raised, thus causing the bar, on moving forward, to meet, and, by its notch or shoulder 12^a, engage the projection 23 on the arm 3. With the further forward movement of the bar 12, the arm 3 is caused to move with it, and thus move the shuttle-box front 1 forward until it reaches a point immediately in front of the lowermost shuttle of a column of newly-filled shuttles contained within a magazine 24 see Fig. 2. While this movement of the arm 3 is going on, the slay is retiring and commencing its return forward movement. The working shuttle is also being ejected as hereinafter described, so that, by the time the cam is about to allow the lever-arm 3 to move backward, the slay is ready to receive the newly-filled shuttle, the lever-arm 3 and the slay then moving back together.

With the first pick and beat up of the new shuttle the finger or arm 18 is lowered and with it the notched bar 12, this taking place when the roller 20 moves on to the flat

part of the cam, which allows of the return of the bar 12 to be quicker than that of the arm 3 and thus permits the bar 12 to drop clear of the projection 23 when lowered by the arm 18.

The magazine 24, which is open top and bottom, is supported by, and secured to, the loom frame by bars 25. The column of shuttles rest upon spring blades 26 forming temporary supports, the blades being fixed at one end to the top part of the magazine, see Fig. 3, and being cranked at the other end and extending below the lowermost shuttle, see Fig. 1.

When the shuttle-box front is moved forward by the lever-arm 3 it meets and presses back the cranked ends of the blades 26, and thus allows the lowermost shuttle to fall down in front of it, see Fig. 2. The shuttle falls on to plates 27 by which it is supported as the box front 1 pushes it into the empty shuttle-box, the slay having recesses in its upper face to allow it to approach the shuttle without obstruction from the plates 27. The empty or faulty shuttle is ejected through an opening in the back wall of the shuttle-box, the shuttle-box having, for the purpose, a loose hinged flap 28 which, on being turned into a position diagonal to the path of the shuttle directs the shuttle through a spout 29 into a receptacle outside the shuttle-box.

The flap 28 is held in its normal position by a spring 30 and is moved out of such position by a lever 31 pivoted directly or indirectly to the loom-frame. This lever, which is cranked at its free end (see Fig. 4) overlies a laterally projecting stud 32 on the finger or arm 18, therefore, when the arm 18 is raised the lever 31 is also raised. Upon the axis of the flap 28 is a lever-arm 33 with downwardly cranked end, see Fig. 3.

With the lever arm 18 raised as the slay completes its forward movement, it will be seen that on the slay retiring the turned down end of the levers 33 will meet the cranked end of the lever 31, and, being prevented moving farther while the slay continues to retire, it will cause the flap 28 to uncover the opening for the ejection of the spent or faulty shuttle, which at that moment is making its return flight. With the return forward movement of the slay, the flap 28 closes the said opening under the pull of its spring, and the moment the lever-arm 33 leaves the cranked end of the lever 31 the shuttle-box is ready to receive the newly-filled shuttle.

It will now be seen that the movements of the several parts and particularly those of the lever-arm 3 are all of a placid and noiseless character, and thus there is less wear and tear than is customary with known replenishing mechanism.

To prevent breakage of any part, owing

say to the miscarriage of the spent shuttle, the axis of the lever-arm 31 is carried by a swivel lever 34 which, under the pull of a spring 35, holds the said axis stationary with a yielding force. This force is stronger than that of the spring which returns the flap 28, and thus the lever-arm-axis always remains in one position, except when the flap 28 fails to open and the lever is pulled backward by the slay.

The weft controlling devices are of any suitable kind, but consist of a lever arm 35, see Fig. 6, fast upon the cross-rod 19 and carrying at its free end the beveled block 36. They also consist of a Z-shaped lever 37 pivotally mounted upon the usual hammer-lever 38 and with one extremity pointing in one direction and the other pointing in the opposite direction, a stud 39 on the lever 38 serving to determine its normal position. Upon the front of the slay is another lever 40 with short arm and long arm, this latter lying more or less horizontal, and the former more or less vertical. In the front of the slay and at a point in the plane of lever 37 is an opening 41.

Upon the tongue or skewer of each shuttle (see Figs. 8 and 9) is a loose sliding block 42, and let into the side of the shuttle is a spring-pressed swivel hook 43. Behind the block is a spring 44. When a cop is placed on the skewer the block is pressed back until it lies behind the hook 43 and has caused such hook to lie with its outer (hook) end within the area inclosed by the outer face of the shuttle.

In the shuttle-box front is formed a slot 45 which extends to the curved end of the said front, and such slot, when a shuttle is in the shuttle-box, is on the same level as the hook. The free end of the lever 40 extends into the slot 45 and lies flush with the inner face of the shuttle-box.

Until the weft in the shuttle is exhausted the block lies behind the hook 43, but as soon as the weft becomes exhausted, (or nearly so), the block under the force of spring 44, moves along the skewer from behind the hook 43 and thereby allows the hook to move outward beyond the outer face of the shuttle.

As the shuttle enters the shuttle-box the hook engages the end of the shorter arm of the lever 40, and, pressing it back, raises the longer arm of the lever until it covers the opening 41. Prior to such opening being covered the forward movement of the slay has no effect on the lever 37, this latter merely projecting into the opening, but when the opening is covered and the slay makes its next forward movement the lever 40 acts upon and tilts the lever 37 until its shoulder 37^a comes opposite to and (under the movements of the hammer-lever 38) engages the block 36 on the lever arm 35,

when the arm oscillates the cross-rod 19 and thus brings into operation the reshuttling apparatus. As soon as the empty shuttle has been ejected the lever 40 again uncovers the opening 41 and the parts resume their normal position.

In Fig. 10 we show a modification of the block and hook, the former being tapered and the latter being in the form of a strip of spring metal and designed to normally lie within the shuttle, but, on the block being moved along the shuttle-tongue, is moved outward and caused to engage the lever 40. The advantage of this arrangement is that it can be cheaply applied. The block may have a small flange 42^a to limit its movements.

The shape of the cam 22 for operating the notched bar 12 is preferably that shown in the drawings, so that the lever-arm 3 shall have a slight dwell when in its most forward position and a quicker return than the slay when the new shuttle is being inserted. To hold the roller 20 to the cam a spring or weight may be employed.

What I claim is:—

1. In replenishing mechanism for looms, a slay and shuttle-boxes, a loose front for one of the shuttle-boxes and a long lever-arm by which said front is carried and which is pivotally mounted upon the axis of one of the slay swords, in combination with means by which the said box-front is yieldingly held in its normal working position, and means whereby, when a newly filled shuttle is required to be inserted into the shuttle-box, the lever-arm is moved forward and caused to pass below a column of newly-filled shuttles, and push the support from below the bottom shuttle, the said means then allowing the lever-arm to have a momentary dwell and then make its return movement toward the slay as the latter moves forward, substantially as herein set forth.

2. In replenishing mechanism for looms in combination a long lever-arm 3 carrying a shuttle-box front and mounted upon the axis of one of the slay swords, a projection

23 on the said lever-arm, a notched bar 12 pivotally suspended upon the loom side and capable of being moved to and fro and at one end capable also of being raised and lowered, a constantly rotating cam of suitable pattern adapted to act upon the notched bar, a pivoted lever-arm and lateral stud by which the free end of the notched bar is supported, a rod extending across the loom and capable of being rotated by suitable weft-controlled devices, a lever-arm on the said cross-rod and a link connecting such lever-arm to the lever-arm which supports the notched bar 3 in normal position, but when the cross-rod is rotated by the weft-controlled devices the notched bar is raised and, by its notch, is caused to engage the projection and thus operate the long lever-arm, substantially as herein set forth.

3. In replenishing mechanism for looms, a shuttle-box having a hinged rear wall and a lever-arm 33 on the hinge pin of said wall, in combination with a cross-rod 19, a lever-arm on such cross-rod with lateral stud, and a lever arm resting upon the lateral stud cranked at its free end and adapted to operate said first mentioned arm while yieldingly mounted at its opposite end, substantially as herein set forth.

4. In replenishing mechanism for looms, a shuttle-box with slotted front, a pivoted lever on the loom-slay, with one end projecting into the slot of the said front, and the other end lying parallel with the front of the slay, in combination with a Z-shaped lever pivoted to the usual hammer-lever of the loom, a cross-rod rotatably mounted in the loom, a lever-rod fixed on the cross-rod and a lateral projection on the said arm, which lies in the plane of movement of the Z-shaped lever, which in turn lies opposite the end of the lever on the front of the slay, substantially as herein set forth.

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

JAMES ROSTRON.

Witnesses:

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