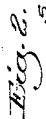
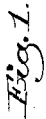


APPLICATION FILED DEC. 12, 1906.

Patented Sept. 19, 1911.

3 SHEETS—SHEET 1.



Treasurer,  
 Harry W. Smith,  
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H. W. SMITH.  
FILLING REPLENISHING MECHANISM FOR LOOMS.  
APPLICATION FILED DEC. 12, 1906.

1,003,528.

Patented Sept. 19, 1911.

3 SHEETS-SHEET 2.

Fig. 3.

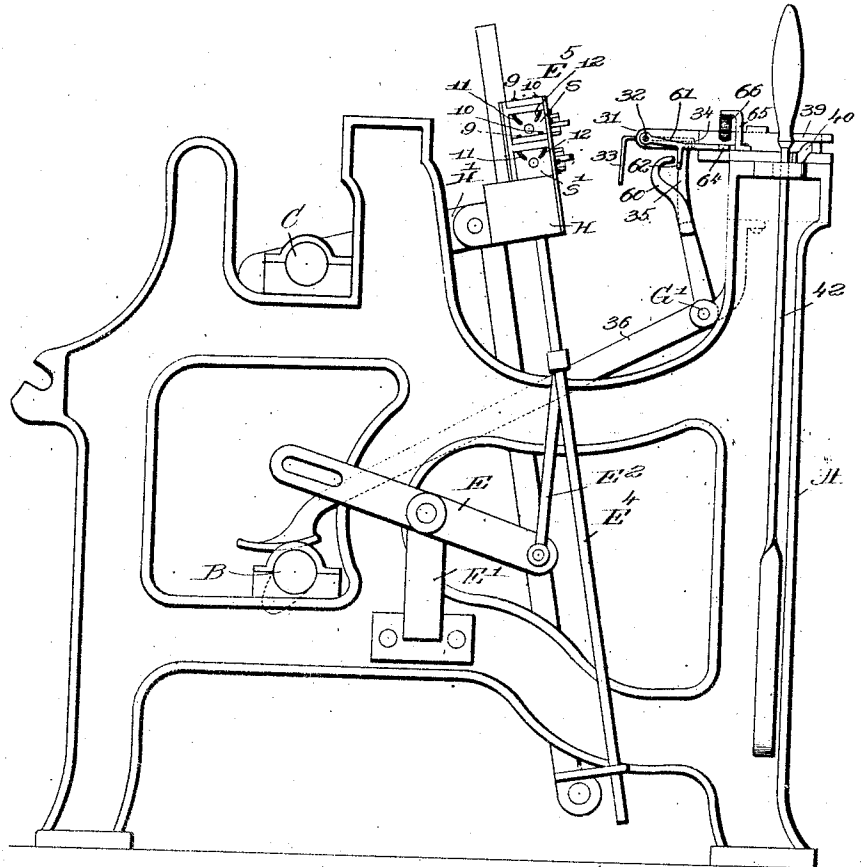


Fig. 3a

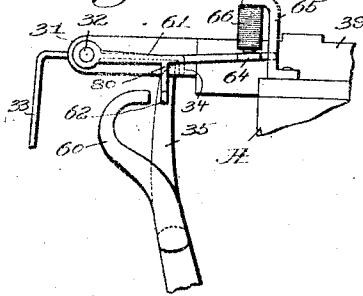
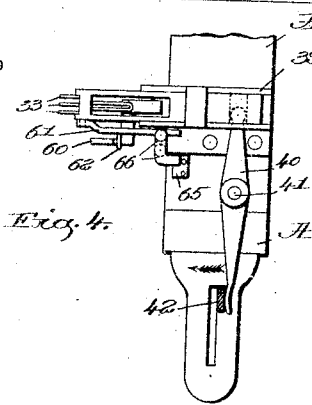


Fig. 4.



Witnesses:  
Fred. S. Crumley,  
Joseph M. Ward.

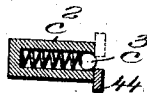
Inventor,  
Harry W. Smith,  
by Henry S. Langley  
attys.

1,003,528.

3 SHEETS—SHEET 3.



Fig. 6.



Witnesses:  
Fred. S. Grunhof.  
Joseph M. Ward,

Traverston.  
Harry W. Smith,  
by Henry Longway  
allies.

# UNITED STATES PATENT OFFICE.

HARRY W. SMITH, OF NORTH GRAFTON, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, A CORPORATION OF MASSACHUSETTS.

## FILLING-REPLENISHING MECHANISM FOR LOOMS.

1,003,528.

Specification of Letters Patent. Patented Sept. 19, 1911.

Application filed December 12, 1906. Serial No. 347,425.

*To all whom it may concern:*

Be it known that I, HARRY W. SMITH, a citizen of the United States, residing in North Grafton, county of Worcester, and State of Massachusetts, have invented an Improvement in Filling-Replenishing Mechanism for Looms, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

In drop shuttle box looms, in connection with which I have herein chosen to illustrate my invention, one of the shuttles has co-acting with it exhaustion detecting mechanism that, prior to complete exhaustion of the filling therein, starts into operation usual filling changing mechanism that transfers a bobbin containing filling from a hopper into a shuttle, while another shuttle in the loom has co-acting with it detecting mechanism that, prior to complete exhaustion of the filling therein, causes the movement of a filling fork to effect the stopping of the loom that the shuttle may, by hand, be supplied with filling, said filling fork also serving to stop the loom in case the filling in either shuttle breaks.

Figure 1 is an elevation partially broken out centrally of the front of a loom with which I have incorporated my invention in one good and simple form; Fig. 2 is a top and plan view of part of a shuttle box and part of a shuttle therein, chiefly to illustrate one form of detecting means; Fig. 3 a left end elevation of the loom; Fig. 3<sup>a</sup> shows the electro-magnet as having lifted the auxiliary tail of the weft fork; Fig. 4 a plan view showing the breast beam near one end, the filling fork, its slide, and means for releasing the shipper handle to stop the loom; Fig. 5 a right side elevation of the loom, and Fig. 6 a detail to be referred to.

Referring to the drawing, the loom frame A, the breast beam A', the cam or cross shaft B, the crank shaft C, the connecting gearing C', C<sup>2</sup> the lay connecting rods H', the lay H adapted to receive and guide drop shuttle boxes E<sup>3</sup>, provided with shuttles s and s', each shuttle having a spindle or bobbin 15 provided with a metallic portion or ring 16 located between two spring arms 13, 14 that close on and touch said ring when the filling is sufficiently removed from the bobbin to uncover said ring, metallic portions 11, 12 carried by the upper

side of said shuttle, the detectors 9, 10, shown as contacts carried by the shuttle box and connected by wires 7, 8 with metallic plates 55, 56 carried by the shuttle box, the electro-magnet b, see Fig. 1 at the right, its armature b<sup>2</sup> pivoted at b<sup>3</sup>, its spring b<sup>5</sup>, the circuit wires 1, 2, the cam a<sup>3</sup> on shaft B, the lever a' pivoted at a<sup>x</sup> on the loom end and having jointed to its front end an actuator a<sup>5</sup> provided with a block b<sup>4</sup>, said actuator being moved at the proper time to meet the dagger 44 of the transferer 26 pivoted at 47, and normally kept in its in-operative position, Fig. 5, by spring 45, the hopper G<sup>6</sup> containing a series of bobbins 22, the dagger holder comprising a tubular portion c<sup>2</sup> and a ball c<sup>3</sup>, the latter retaining the dagger in its elevated or lowered position, the dagger, when in its elevated position, being struck by the bunter 43 carried by the lay, to thereby cause the transferer to push a bobbin from the hopper into the open upper side of the shuttle and into position between the usual bobbin-holding arms carried by the shuttle prior to complete exhaustion of the filling in the uppermost shuttle s, as herein shown, of the two cells of the shuttle box when said shuttle occupies a position at the level of the race of the lay, are and may be all as fully shown and described in United States Patent No. 692,934, dated February 11, 1902, and in my application Serial No. 331,736, filed August 23, 1906. The loom shown in my said application describes and claims as of invention a second shuttle located in the drop shuttle box that, when the filling therein is exhausted, starts into operation a filling fork to stop the loom that fresh filling may be supplied to the second shuttle by hand.

The loom herein shown is represented as provided with a drop shuttle box having two shuttles, the upper or being marked s, and the other s', the invention to be herein claimed being directed more especially to the shuttle s' and the parts co-acting therewith, and also in combination with other parts of the loom.

Each of the shuttles s and s' is supposed to have like bobbins, springs 13, 14, metallic ridges 11 and 12, spring contacts 9, 10, wires 7, 8, each leading to like plates, the plates co-acting with the under shuttle s' being marked 55<sup>x</sup> and 56<sup>x</sup>. These shuttles

are carried by a shuttle box rod E<sup>4</sup> guided in usual manner and having an attached link E<sup>2</sup> connected at one end with a shuttle box lever E pivoted on a stand E' connected to the loom side, and said lever may be operated as provided for in said patent, or in any other usual way commonly employed to actuate a rod in the movement of drop shuttle boxes, according to the requirements of protuberances on any usual drop shuttle box pattern chain.

The lever 36 pivoted at G' and having an arm 35 that engages the tail 34 of the weft fork 33 pivoted at 32 on the weft fork slide 31 fitted to be moved in a guideway 39, said slide co-acting with a knock-off lever 40 pivoted at 41, the opposite end of which contacts with a shipper lever 42 of usual shape which, when released through usual means common to looms, effects the stopping of the loom, are also common to my said patent and said application, so need not be herein further described. I have attached to the arm 35 of this usual weft fork actuating lever an auxiliary arm 60, and I have movably mounted on the pivot 32 of the weft fork an auxiliary tail 61 shown in Fig. 3, and enlarged in Fig. 3<sup>a</sup>, said tail having near its outer end a metallic projection 64 that constitutes an armature, said tail having a depending portion 80 provided near its lower end with a substantially horizontal projection 62. I have also mounted upon the loom end a stand 65 that sustains an electro-magnet 66 connected by wires 67 68 to the contacts 69, 70. I have also added to the loom construction a battery M having wires 82, 83, the wire 82 leading to the plate 55<sup>a</sup>, and the wire 83 to switch 72 pivoted on an insulation carried by a depending arm 73 of the lay. The insulated part of arm 73 sustains a second switch 71, the latter being connected with plate 56<sup>a</sup> by a wire 84. The free ends of switches 71 and 72 are connected with the floor of the lower cell of the shuttle box E<sup>2</sup> by a rod 74, so that when the uppermost shuttle s in said box, it being that shuttle that is supplied with filling automatically prior to complete exhaustion, is at the level of the race of the lay, the switches will be turned into operative position with relation to the two terminals 73 and 74 of the circuit wires 1, 2; but when the box containing the shuttle s', which may have a filling differing in character, quality, or size, and not so frequently used as the filling in shuttle s, is at the level of the race of the lay, then the switches 71 and 72 occupy their full line positions Fig. 1, and complete the circuit from the battery M through the wires described to the electro-magnet 66.

Whenever, prior to complete exhaustion of the filling, the ring 16 connected with the bobbin 15 of the shuttle s' is uncovered by

the removal of filling from said bobbin, the detector described energizes the electro-magnet 66, causing it to attract the armature 64 forming part of the rear end of the auxiliary tail of the weft fork, raising said tail into the position Fig. 3<sup>a</sup>, so that when the auxiliary arm 60 is next moved toward the breast beam, the end of that arm will meet the projection 62 of the arm 80, and will move the weft slide outwardly or to the right, Fig. 3, causing said slide to turn the knock-off lever and release the shipper lever 42. It will be understood, therefore, that one of the shuttles in the shuttle box, as herein shown the upper shuttle, will be supplied automatically with filling prior to complete exhaustion of the filling therein, as provided for in my earlier patent, and that the shuttle s', such exhaustion of the filling in the other shuttle, herein designated as the shuttle s', such exhaustion of the filling will effect the movement of the weft fork to stop the loom so that the filling in that shuttle may be re-supplied by hand. Also it will be understood, in case the filling breaks in either of the two shuttles, that the absence of the filling on the race of the lay will leave the tail end of the weft-fork in condition to be caught by the arm 35, which will effect the movement of the weft-fork slide and move the knock-off lever to release the shipper-lever.

I believe that I am the first to provide means in a loom for supplying filling automatically to one shuttle prior to complete exhaustion, and of stopping the loom prior to complete exhaustion of the filling in another shuttle, and I desire to claim this feature broadly.

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

1. In a loom having drop shuttle boxes each provided with a shuttle, means co-acting with one of said shuttles to automatically supply the same with filling prior to complete exhaustion, and means co-acting with and under the control of another of said shuttles to stop the loom prior to complete exhaustion of the filling therein.

2. In a loom, filling changing means, drop or shifting shuttle boxes, a shuttle in one of said boxes provided with means to effect a change of filling prior to complete exhaustion, a second shuttle in another of said drop or shifting shuttle boxes, means co-acting with said shuttle to stop the loom prior to complete exhaustion of the filling, and means carried by the loom to effect a stoppage of the loom in case of breakage of the filling, or failure of the detecting means in either shuttle.

3. In a loom, filling changing means, drop or shifting shuttle boxes, means by which a change of filling in one of the boxes may be

brought about automatically prior to complete exhaustion, means by which a change of filling in the other box or boxes may be effected manually before complete exhaustion, and filling detecting means by which in case of breakage of the filling, or failure of the detecting means to act on the filling in any of the shuttles, the loom is stopped.

4. In a loom having filling changing mechanism, a drop shuttle-box, a shuttle in one of the cells of said box, and detecting means to effect a change of filling in said shuttle prior to complete exhaustion, a second shuttle in another cell of said shuttle box, and means to stop the loom prior to complete exhaustion of the filling in said shuttle.

5. In a loom having drop shuttle boxes, each provided with a shuttle, means to automatically supply one shuttle with filling prior to complete exhaustion, and means to

stop the loom prior to complete exhaustion of the filling in another of said shuttles.

6. In a loom, filling changing means, drop or shifting shuttle boxes, a shuttle in one of said boxes, means to effect a change of filling in said shuttle prior to complete exhaustion, a second shuttle in another of said drop or shifting shuttle boxes, and means to stop the loom prior to complete exhaustion of the filling, and means to effect a stoppage of the loom in case of breakage of the filling, or failure of the detecting means in either shuttle.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

HARRY W. SMITH.

Witnesses:

M. G. FOLEY,  
M. T. CRIMMINS.