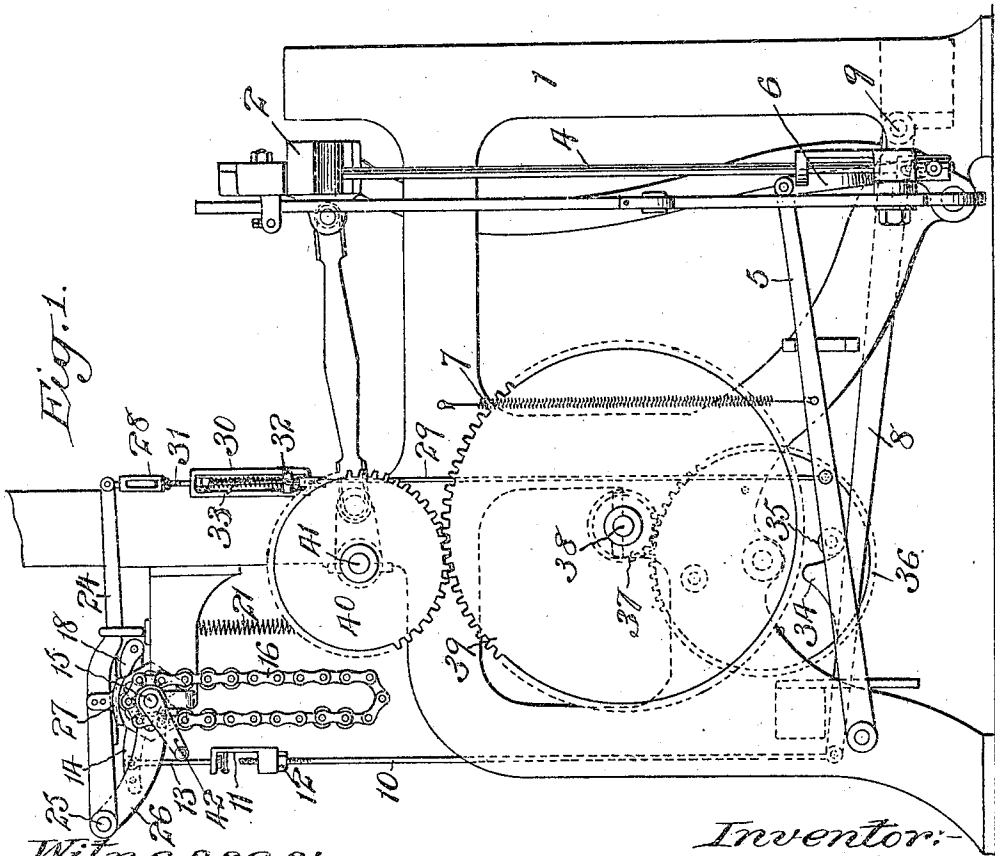
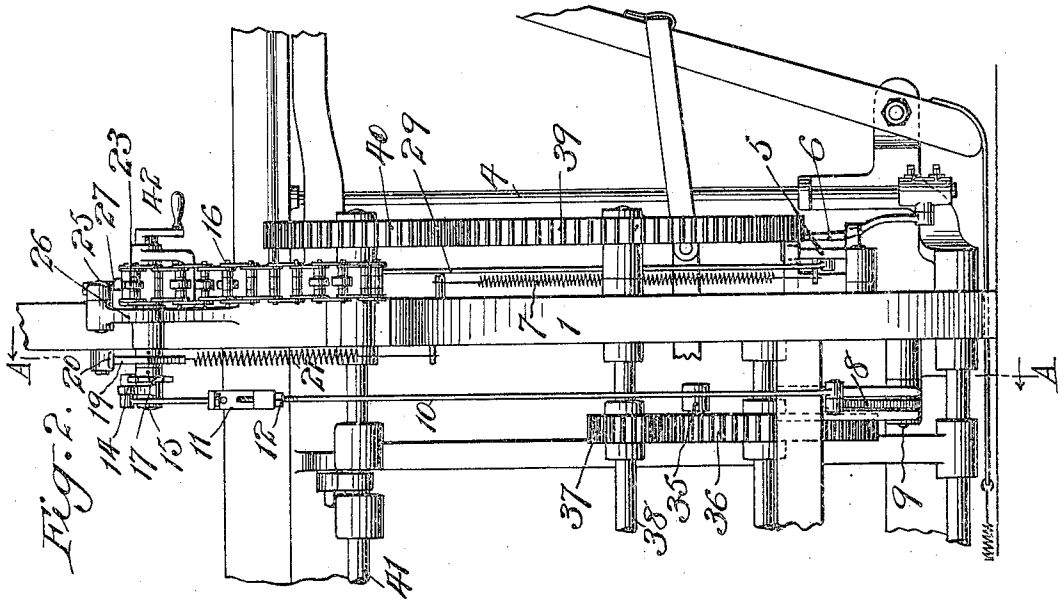


W. J. LUTTON.
BOX LOOM.
APPLICATION FILED MAY 10, 1907.

953,275.

Patented Mar. 29, 1910.

2 SHEETS—SHEET 1.



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Fig. 7.

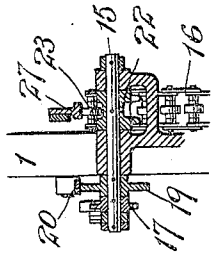


Fig. 6.

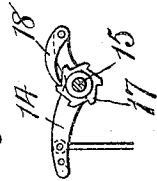


Fig. 3.

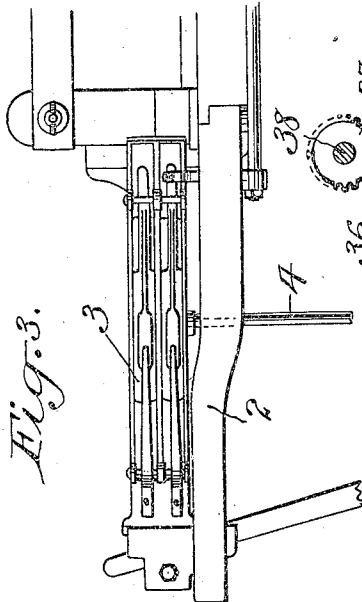


Fig. 5.

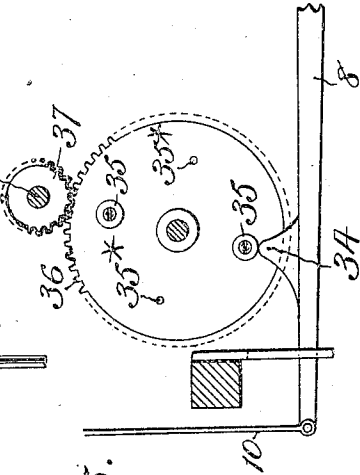
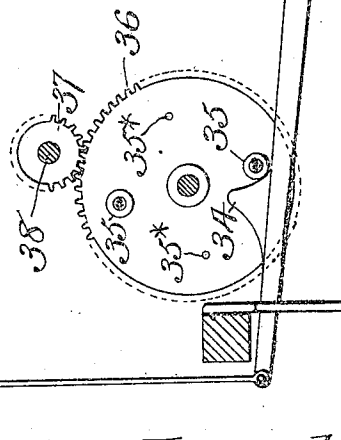
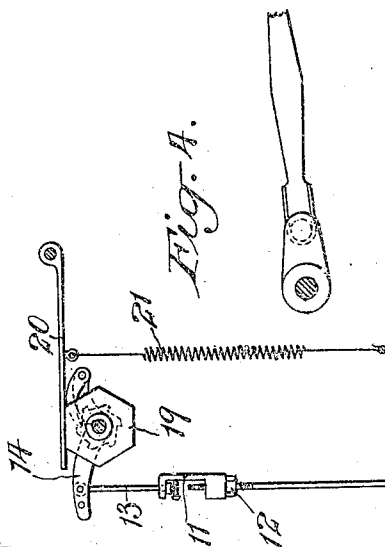


Fig. 4.



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UNITED STATES PATENT OFFICE.

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BOX-LOOM.

953,275.

Specification of Letters Patent. Patented Mar. 29, 1910.

Application filed May 10, 1907. Serial No. 372,921.

To all whom it may concern:

Be it known that I, WILLIAM J. LUTTON, a citizen of the United States, and resident of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Box-Looms, of which the following is a specification.

My invention relates to box looms with the object in view of providing effective mechanism for changing the boxes at several different intervals without changing the gear and, at the same time, providing for either plaid or plain weave and for a high rate of speed.

A further object is to provide mechanism of the above character which may be applied to looms at present in use.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view, in end elevation, of so much of a loom as will suffice to illustrate my invention, Fig. 2 is a partial rear elevation of the same, Fig. 3 is a partial front view of the same, Fig. 4 is a vertical section in the plane of the line A—A of Fig. 2, Fig. 5 is a partial section in the same plane showing the parts in a different position from that shown in Fig. 4, Fig. 6 is a view in detail of the ratchet and pawl for operating the box controlling chain, and Fig. 7 is a section in detail through the chain support and parts in immediate proximity thereto.

The loom frame is denoted by 1; the drop box frame by 2, the drop boxes by 3, the rod for raising and lowering the boxes in their frame by 4, the main box operating lever for operating the rod, by 5, and the link for connecting the free end of the lever 5 with the rod 4, by 6. These parts, and the several parts which usually coact therewith, may be of any well known or approved form and a description of them in detail is omitted.

The lever 5 which is relied upon to operate the drop box mechanism is partially counterbalanced by means of a spring 7 fixed at one end to the main frame and at the other end to the lever 5, the intention being that the weight of the drop boxes and their operating mechanism, together with the lever 5, shall be sufficient to fall under the influence of gravity when permitted to

do so, the spring 7 being relied upon to relieve any injurious jar when the parts reach the limit of their downward movement.

My present invention is directed to mechanism for operating the lever 5 either at frequent intervals during the revolution of the drive shaft or only once at pleasure and consists of the following parts:—An auxiliary lever 8 is fulcrumed as at 9 to the frame 1 and its free end is connected by a rod 10 with a coupling piece 11, the said coupling piece 11 having a screw threaded engagement with the rod 10 to vary the length of the rod as a whole and a jam nut 12 being provided to lock the rod 10 in its adjusted position with respect to the coupling 11. The coupling 11 has swiveled in its upper end a link 13 which is connected with a crank arm 14 loosely mounted on a shaft 15 which carries a pattern chain 16. The shaft 15 has also fast thereon a ratchet toothed wheel 17, (see Figs. 4, 6, 7), arranged to be engaged by a pawl 18, the latter carried by an extension of the crank arm 14 and adapted to operate the ratchet wheel and hence the shaft, when the arm 14 is moved downward. In the present instance, the ratchet wheel 17 is provided with six teeth and the shaft 15 has thereon a polygonal shaped disk 19 with one side of which an arm 20 engages, the arm 20 being under yielding spring tension in the present instance by means of a spring 21 to hold the shaft 15 against accidental displacement in the position in which it is rocked but at the same time having a yielding movement to permit the shaft to be rocked under the positive action of the arm 14. The shaft 15 also carries the pattern chain wheel 22 on which the pattern chain 16 is supported, the pattern chain 16 being provided with rollers arranged in such groups as may be desired either to maintain the previous position of the box operating lever 5 or positively lifting it or permit it to lower as may be desired.

A lever 24 is fulcrumed at 25 in a bracket 26 projecting from the main frame and rests through the medium of a shoe 27 on the pattern chain, the free end of said lever 24 being connected by link 28, rod 29 and coupling 30 with the main box operating lever 5. The link 28 has an adjustable rod 31 projecting from it through the end of the

coupling 30 and along down the said coupling to a cross head 32, the latter arranged to slide longitudinally of the coupling 30 and a spring 33 is interposed between the upper end of the coupling and the cross head 32 to make the connection between the link 28 and rod 29 yielding.

The auxiliary lever 8 has on it a slanting faced projection 34 in position to engage one or more of the rollers 35 set in the face of a spur wheel 36 geared to a pinion 37 on the drive shaft 38. The face of the wheel 36 is provided with four perforations 35* set at a quadrant's distance apart for the purpose of attaching to the face of the wheel 36 one, two or four rollers 35 as may be desired. If a single roller 35 be attached to the face of the wheel 36, the pattern chain will be operated but once during the revolution of the wheel 36. If two rollers 35 be attached to the face of the wheel 36, in positions diametrically opposite, the pattern chain will be changed twice during the revolution of the wheel 36 and in the event four rollers are applied to the face of the wheel 36 at a quadrant's distance apart, the pattern chain will be changed four times during the revolution of the wheel 36. The shaft 38 carries, in the present instance, a spur wheel 39 which serves to drive a spur wheel 40 on a shaft 41, the latter being provided with a crank arm indicated in dotted lines, Fig. 1, for operating the lay. In the present instance, the wheel 40 bears the relation to the wheel 39 of one to two and it is to be assumed that two picks take place during the revolution of the shaft 38, the lay operating wheel 40 driven by 39 serving to operate the lay to beat the weft threads into position after each pick. If then, we assume that the pinion 37 bears the relation to the wheel 36 of one to four and there are four rollers 35 at a quadrant's distance apart on the face of the wheel 36, the pattern chain will be operated at an interval of every two picks, *i. e.*, a revolution of the drive shaft 38 will turn the wheel 36 one quarter of a revolution. If, on the other hand, but two rollers be placed on the wheel 36 at 180° apart there will be an interval of four picks between the operations of the pattern chain while if but one roller be placed on the wheel 36 there will be an interval of eight picks between the operations of the pattern chain.

The pattern chain 16 may be provided with several rollers 23 successively placed so that succeeding steps of rotation of the ratchet wheel 17 will make no change in the position of the boxes or there may be intervals left between successive rollers on the pattern chain which will produce a new position of the boxes at succeeding steps of movement of the pattern chain.

The grouping of the rollers on the pattern chain and the intervals between the groups will determine whether the boxes shall retain their position at successive steps or change their position at successive steps. In any event, every time the auxiliary lever 8 is moved by a roller on the wheel 36 engaging the inclined faced projection 34 it will move, through the jointed rod 10 and arm 14, the ratchet wheel one step and hence will advance the pattern chain one step and in this position the pattern chain will be held until the lever 8 is again operated by a roller on the wheel 36. For convenience in setting the pattern chain into any desired position, I provide a crank 42 which may be readily manipulated by the hand of the operator.

The structure hereinabove described is such that it may be applied to looms as they are now constructed without any material change in the assembling of their parts and serves to materially increase the capacity of the loom for a variety of plaid work and at the same time it may be used for plain weave if so desired.

The foregoing construction is such that the drive shaft of the loom may be run at a high rate of speed without interfering with the prompt and effective step by step operation of the pattern chain and hence the positive changing of the boxes at such intervals as may be desired.

What I claim is:—

1. In a box loom, the combination with the loom driving shaft, the lever for operating the boxes, a pattern chain and means for placing the box operating lever under the control of the pattern chain, of an auxiliary lever connected with the pattern chain to operate it and means for operating the said auxiliary lever and hence the pattern chain at different intervals with respect to the revolutions of the loom driving shaft.

2. In a box loom, the combination with the lever for operating the boxes, a pattern chain and means for placing the box operating lever under the control of the pattern chain, of an auxiliary lever provided with an inclined surface, a driven wheel, removable lever operating devices set in the wheel at intervals along its surface and means for placing the pattern chain under the control of the said auxiliary lever whereby the pattern chain may be operated at different intervals.

3. In a box loom, the combination with the box supporting rod, its box operating lever connected with the rod for operating it and a pattern chain connected with the lever for operating it, of an auxiliary lever provided with an inclined faced projection, a wheel connected with the drive shaft and provided with removable rollers located at

intervals on its face in position to engage the inclined faced projection on the auxiliary lever and a pawl and ratchet mechanism arranged to operate the pattern chain and to
5 be actuated by the said auxiliary lever.

In testimony, that I claim the foregoing as my invention, I have signed my name in

presence of two witnesses, this first day of May, A. D. 1907.

WILLIAM J. LUTTON.

Witnesses:

CHARLES F. MOREHEAD.

THOMAS W. RANDALL,