

(No Model.)

J. L. McKAY.
LOOM.

4 Sheets—Sheet 1.

No. 567,351.

Patented Sept. 8, 1896.

Fig. 1.

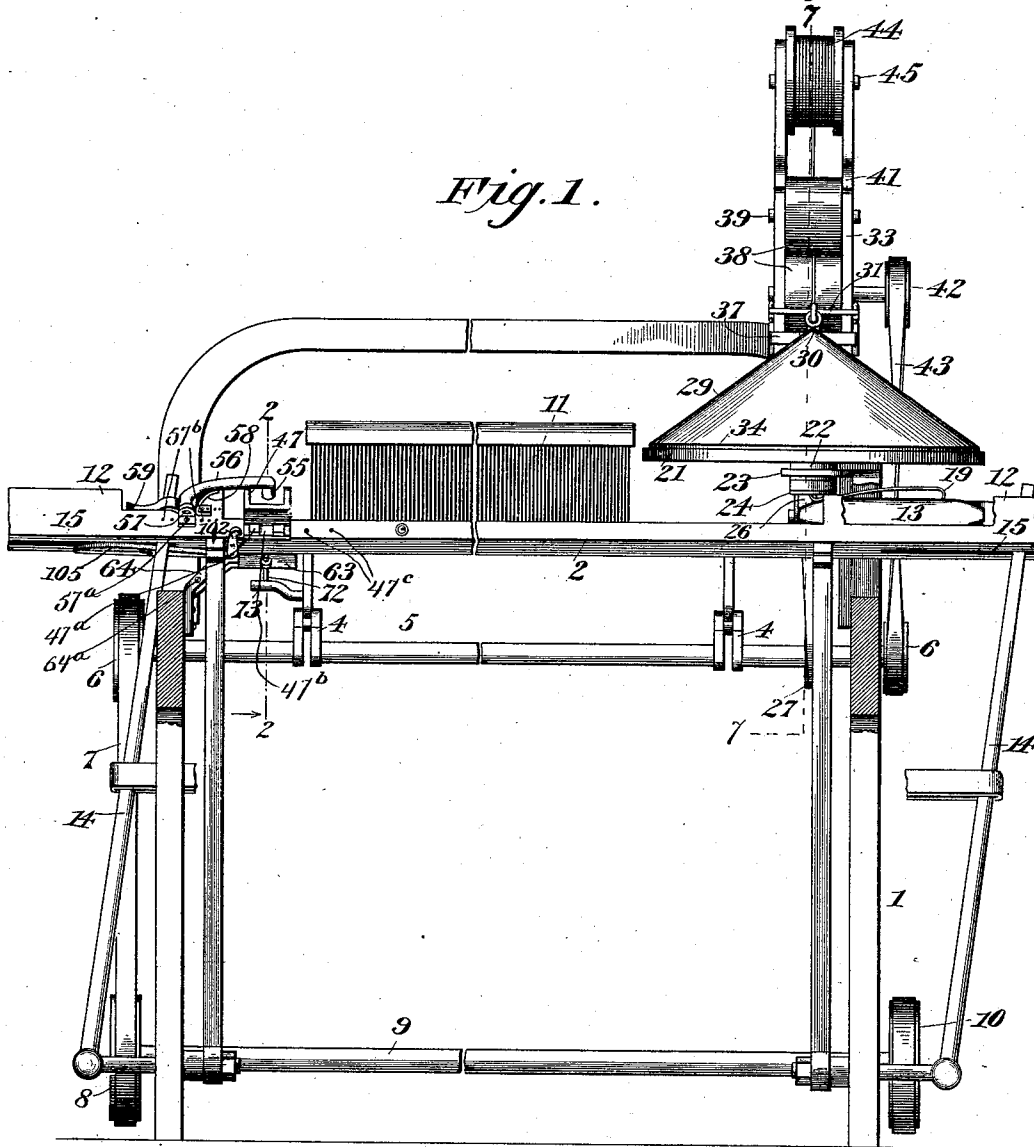
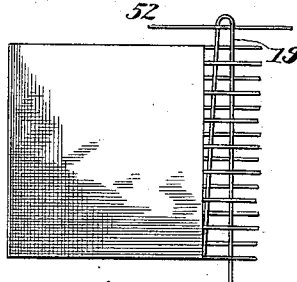


Fig. 10.



Witnesses;

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(No Model.)

4 Sheets—Sheet 2.

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Fig. 4.

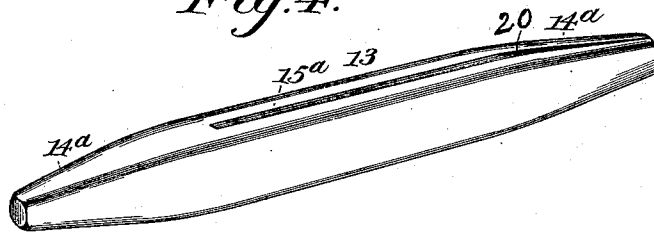


Fig. 5.

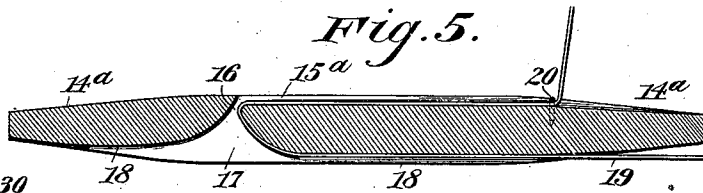


Fig. 6.

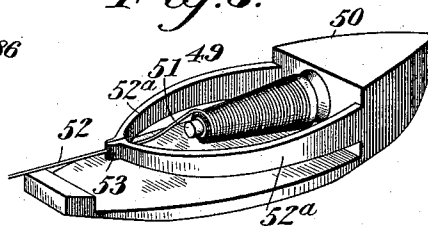
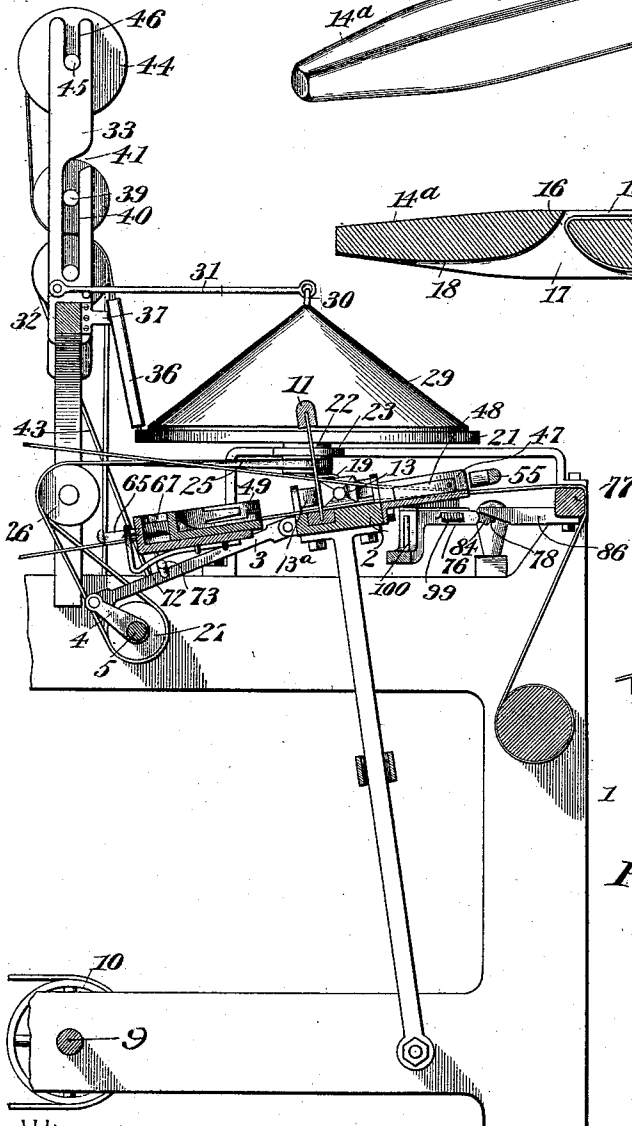


Fig. 2.



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4 Sheets—Sheet 3.

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Fig. 3.

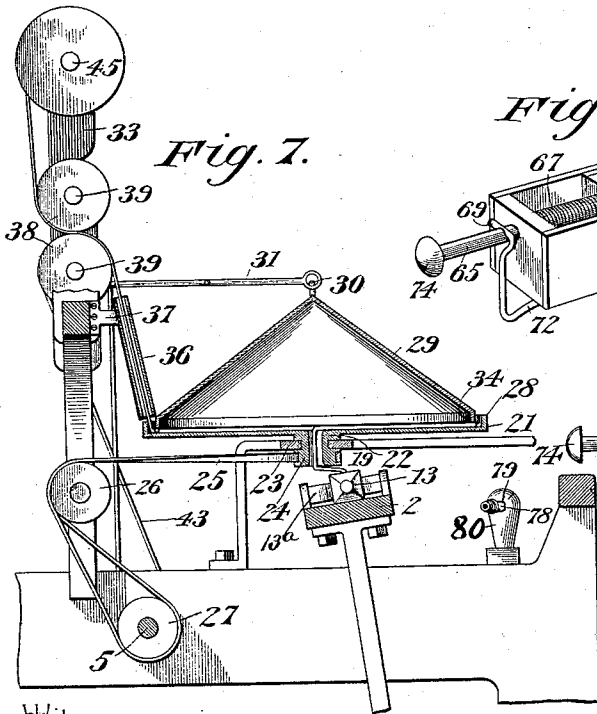
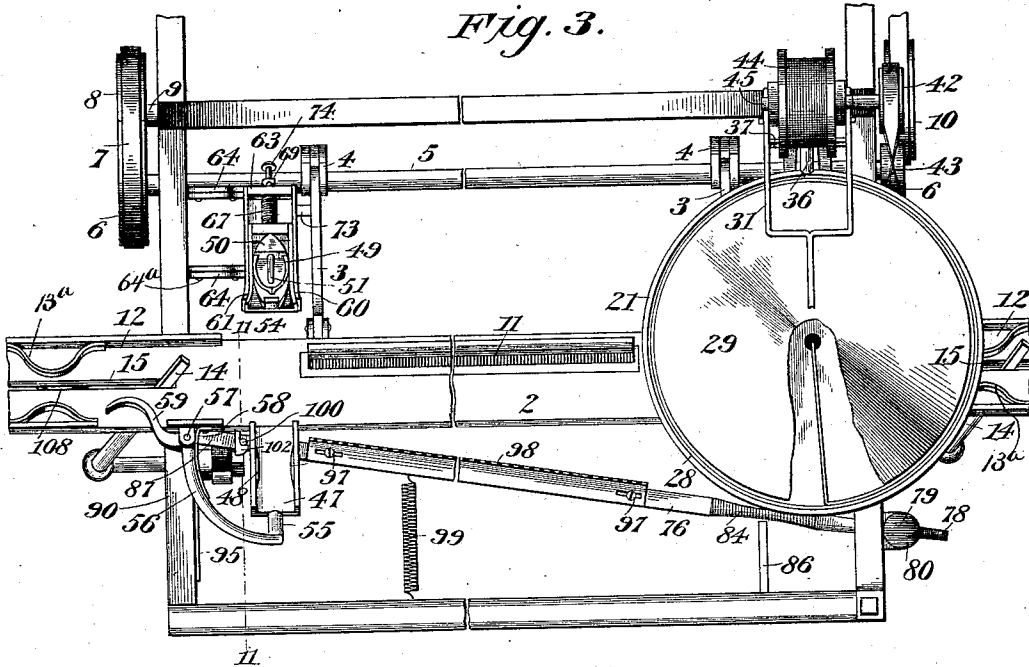


Fig. 7.

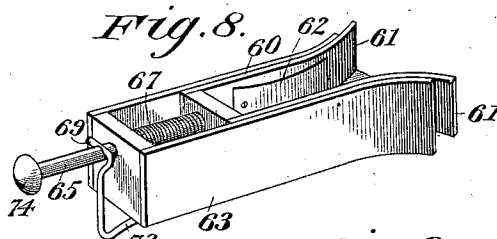
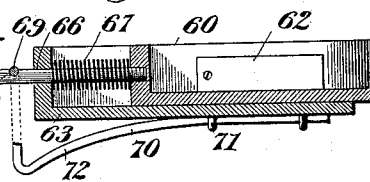


Fig. 8.

Fig. 9.



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(No Model.)

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LOOM.

No. 567,351.

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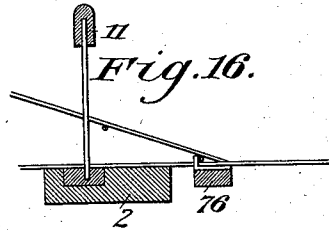
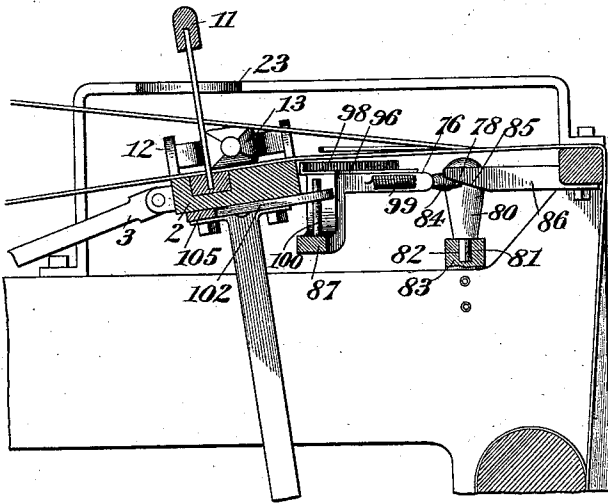


Fig. 11.

Fig. 14.

Fig. 12.

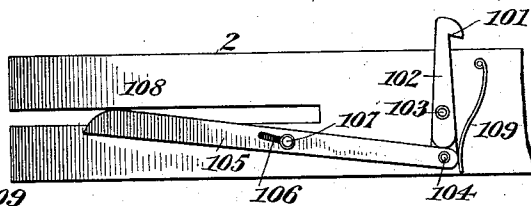
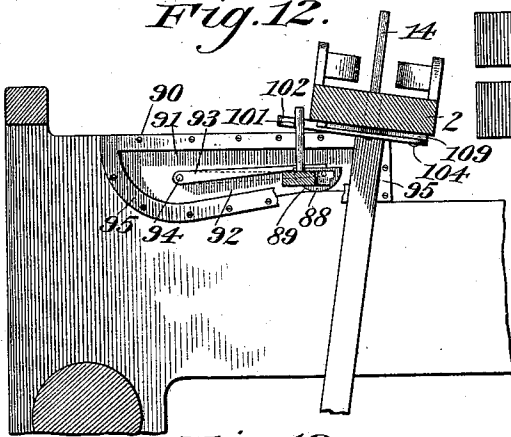
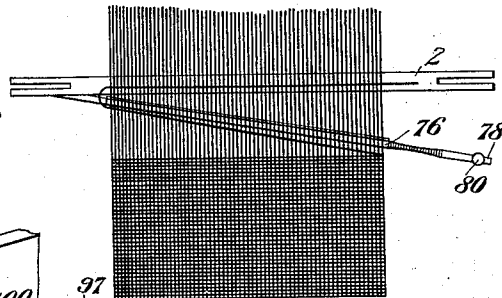
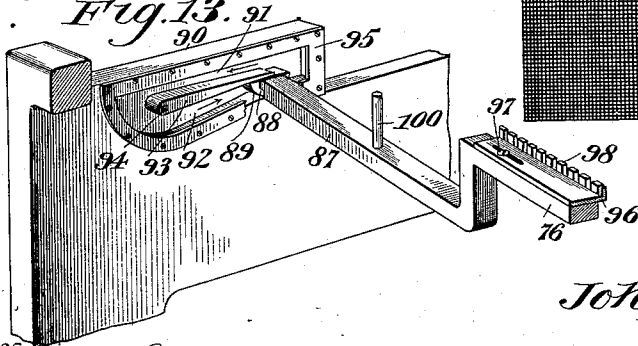


Fig. 15.

Fig. 13.



Witnesses

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UNITED STATES PATENT OFFICE.

JOHN LLOYD MCKAY, OF KING'S MOUNTAIN, NORTH CAROLINA.

LOOM.

SPECIFICATION forming part of Letters Patent No. 567,351, dated September 8, 1896.

Application filed June 26, 1895. Serial No. 554,111. (No model.)

To all whom it may concern:

Be it known that I, JOHN LLOYD MCKAY, a citizen of the United States, residing at King's Mountain, in the county of Cleveland and State of North Carolina, have invented a new and useful Loom, of which the following is a specification.

This invention relates to looms; and it has for its object to effect certain improvements in that class of looms known as "needle-looms," whereby simple and efficient means shall be provided for weaving the cloth in such a manner as to save both time and labor.

To this end the main and primary object of the present invention is to provide certain new and useful improvements for carrying out a mode of weaving that insures not only a quick weaving of the cloth, but also involves less attention to the loom than is ordinarily required.

With these and other objects in view, which will readily appear as the nature of the invention is better understood, the same consists in the novel construction, combination, and arrangement of parts hereinafter more fully described, illustrated, and claimed.

In the drawings, Figure 1 is a front elevation, partly in section, of a loom equipped with the herein-described improvements. Fig. 2 is a vertical sectional view on the line 2 2 of Fig. 1. Fig. 3 is top plan view of the construction illustrated in Fig. 1. Fig. 4 is a detail in perspective of the needle-shuttle. Fig. 5 is a central longitudinal sectional view of the needle-shuttle. Fig. 6 is a detail in perspective of the selvage-shuttle. Fig. 7 is a detail sectional view on the line 7 7 of Fig. 1. Fig. 8 is a detail in perspective of the rear movable shuttle-box for the selvage-shuttle. Fig. 9 is a central longitudinal sectional view of the construction shown in Fig. 8. Fig. 10 is a diagrammatic view illustrating the manner in which the loop of the weft-thread is caught by the side loop-holding thread. Fig. 11 is a detail sectional view on the line 11 11 of Fig. 3, looking toward the thread-pan side of the machine and omitting certain parts, so as to clearly illustrate the connection between the main and false batten. Fig. 12 is a similar view, also on the line 11 11 of Fig. 3, looking in an opposite direction to the view illustrated in Fig. 11. Fig. 13 is

a detail in perspective, showing clearly the construction of the grooved guide-block and the slide connection of the false batten with such block. Fig. 14 is a bottom plan view of one end of the main batten carrying the combined lock and releasing device for the false batten. Fig. 15 is a diagrammatic plan view illustrating the angle formed between the two threads of the loop of the weft when it is carried through the shed of the warp and also the corresponding angle formed between the main and false battens when the same have reached the limit of their backward beats or strokes. Fig. 16 is a diagrammatic sectional view illustrating the engagement of the slay-plate of the false batten with the lower thread of the weft-loop, so as to force such thread up into place in the warp in advance of the other thread of the loop which is carried up by the slay of the main batten.

Referring to the accompanying drawings, 1 designates a part of the main frame of a loom, within which is arranged to work the usual swinging batten 2, that is moved back and forth by means of the pitmen 3, connected with the batten and also with the cranks 4 of the crank-shaft 5, journaled within the frame 1 and carrying upon its opposite extremities the belt-wheels 6, one of which belt-wheels receives the belt 7, that is driven from the belt-wheel 8 from one end of a drive-shaft 9, journaled in the frame below the shaft 5, and carrying upon the end opposite the wheel 8 the belt wheel or pulley 10, that receives the belt for transmitting motion to the working parts of the machine. The gearing connections just described are simply those connections that are necessary to illustrate the working of the parts employed in connection with the herein-described improvements.

The batten 2 carries the usual reed 11, and is provided at its opposite ends with the end shuttle-boxes 12, that are adapted to receive therein the needle-shuttle 13, which carries the weft-thread through the shed formed by the crossed warp-threads, which are crossed and recrossed in the usual manner by means of the ordinary harness. (Not shown.) The end shuttle-boxes 12 of the batten are provided at their opposite inner sides with the reversely-disposed bowed shuttle-holding

springs 13^a, between which the needle-shuttle is forced and is firmly held in place before being started on its way toward either end of the batten, and the said needle-shuttle is driven across the batten and through the shed by means of the ordinary picker-sticks 14, the upper ends of which work in the slots 15, formed in the ends of the batten, and which picker-sticks are oscillated by the ordinary picker mechanism.

In the present invention the needle-shuttle consists of a solid body pointed at both ends, as at 14^a, so that the same will readily enter the shed of the warp in being started on its travel toward either end of the batten, and on its upper side the said needle-shuttle is provided with a longitudinal thread-groove 15^a, leading from one end of the shuttle-body to an intermediate point, where it communicates with a thread-eye 16, that opens into an enlarged thread-recess 17, formed in the lower side of the shuttle-body. The said thread-recess 17 communicates with the bottom thread-grooves 18, formed in the lower or bottom side of the shuttle-body and extending from the recess 17 to the extreme ends of the shuttle-body to receive therein the lower portion of the weft-thread 19 as the needle-shuttle is moved back and forth through the shed of the warp. It will be understood by reference to Fig. 5 of the drawings that on its forward movement the needle-shuttle 13 will carry the weft or woof thread in a loop through the shed of the warp, thereby weaving two weft or woof threads in each cross of the warp instead of one, as in the ordinary method of weaving. In this movement of the needle-shuttle a portion of the weft-thread will lie in the thread-groove 15^a, and a portion will also lie in the bottom thread-groove 18, leading toward the rear end of the shuttle-body, and on the reverse movement, when the needle-shuttle travels back on the upper strand of the weft, the lower strand of the weft will lie in the short thread-groove 18, leading from the recess 17 toward the front end of the needle-shuttle.

The needle-shuttle 13 is provided near one end and within the upper thread-groove 15^a with a threading-eye 20, through which the thread 19 is threaded before being passed through the main eye 16 of the shuttle, and the eye 20 provides for holding the weft-thread properly threaded in the needle-shuttle, so that the said shuttle will carry the weft or woof thread evenly through the warp. The weft-thread 19 is evenly distributed or paid out to the needle-shuttle 13 by means of the revolving thread-pan 21. The thread-pan 21 is supported in a horizontal position and is provided with a centrally-perforated depending collar 22, mounted for rotation in the bearing-support 23, secured at one side of the frame 1 of the loom, and at its lower end the depending collar 22 of said thread-pan is provided with a pulley 24, over which is passed one portion of an operating-belt 25, that leads

in a horizontal direction from the pulley 24, and the separate portions of which belt pass over the idler-pulleys 26, suitably mounted within the frame of the machine at one side thereof. Below the idler-pulleys 26 the belt 25 passes over a drive-pulley 27, mounted on the crank-shaft 5 near one end thereof, thus completing a drive connection for imparting rotation to the thread-pan 21.

The thread-pan 21 is provided with a peripheral upturned flange 28, inside of which flange is coiled sufficient of the weft or woof thread to supply the demand of the needle-shuttle during each complete throw thereof. The thread-pan revolves just fast enough to coil within the flange thereof, without kinking, a sufficient number of convolutions of the weft-thread to supply the needle-shuttle, as already stated, and this coiling of the weft-thread within the weft-pan, to prevent tangling or kinking thereof, is positively insured by means of the conical pan-cover 29. The conical pan-cover 29 is arranged directly over the thread-pan 21 and is properly supported in position from its apex, as at 30, by means of a swinging bracket 31, pivotally connected, as at 32, to opposite sides of an upright bearing-frame 33, supported on one side of the main frame of the loom. The bracket 31, by means of its pivotal support, allows the cover 29 for the thread-pan to be readily lifted up out of the way when it is necessary to thread the weft through the collar of the thread-pan, or for any other purpose, and the said conical pan-cover 29 is provided at its lower edge with a vertically-disposed flange 34, that lies within the thread-pan a sufficient distance from the flange 28 thereof, so as to cause the weft-thread to coil within the thread-pan as the latter revolves, and at the same time the thread-pan cover acts in the capacity of a protector for the weft-thread within the thread-pan.

The weft-thread is guided into the space between the flanges 28 and 34 by means of the inclined tubular thread-guide 36, properly supported in position above and at one side of the thread-pan by means of the bracket-arm 37, attached to the upright bearing-frame 33. The thread is fed into the upper end of the tubular thread-guide 36 by means of a pair of feed-rollers 38. The feed-rollers 38 are arranged one above the other within the bearing-frame 33, and the spindle extremities 39 of said rollers are journaled in the opposite vertically-disposed bearing-slots 40, formed in opposite sides of the frame 33 and communicating at their upper ends with openings 41, that provide convenient means for readily removing or replacing the said feed-rollers. The lower of said feed-rollers 38 has mounted on one spindle extremity the belt-wheel 42, over which passes the upper portion of the belt 43, that is driven from the belt-wheel 6 at one end of the crank-shaft 5, and provides means for transmitting a positive motion to the lower feed-roll, so that the

thread that passes between the two feed-rolls will be positively fed to the thread-pan 21 sufficiently fast to supply the needle-shuttle, which draws the thread from the thread-pan 5 through the central combined bearing and thread-collar thereof. The weft-thread that passes between the feed-rollers 38 is drawn by said rollers from the spool 44, mounted within the upper end of the frame 33, and the spindle extremities 45 of which spool are removably fitted in the bearing-notches 46, formed in opposite sides of the frame 33 at the upper extremity thereof, and at this point it will be noted that by reason of feeding the weft-thread to the main needle-shuttle from a spool a constant refilling of a shuttle is rendered unnecessary, as in the ordinary looms, because the spool 44 may carry sufficient thread to run the loom constantly 20 any desired number of hours without stopping.

The batten 2 has adjustably fitted to the front side thereof, near one end, a substantially rectangular shuttle-box 47, the adjustment of said box being longitudinally of the batten, so that the box can be properly adjusted, according to the width of the cloth that is being woven. The adjustment of the box 47 may be conveniently secured by the 30 employment of screws or bolts 47^a, passed through the flange 47^b at one end of the box 47 and engaging in any of a series of openings 47^c, formed in the batten. The front shuttle-box 47, that is fitted to the front side 35 of the batten near one end, is provided at opposite inner sides with oppositely-disposed shuttle-holding springs 48, between which is adapted to be forced and held in position within the front shuttle-box a selvage-shuttle 49, that has a travel at direct right angles to the needle-shuttle and directly adjacent to the edge of the warp opposite the thread-feeding mechanism for the needle-shuttle. The said selvage-shuttle 49 consists, essentially, of an elliptically-shaped body provided with an enlarged spindle-block 50 at one end, and to which spindle-block is fitted the thread-spindle 51, that carries the loop-holding thread 52; that is adapted to be passed 50 through the loop of the weft or woof at one side edge of the warp. The said selvage-shuttle 49 is further provided with the opposite reversely-disposed bowed spring-tension arms 52^a, that are extended from opposite 55 sides of the spindle-block 50 directly over the main body of the shuttle. The said spring-tension arms 52^a are also convergently disposed and are provided beyond one end of the spindle 51 with the abutting flat clasp-flanges 53, between which passes the loop-holding thread 52 as it leaves the thread-spindle, and which flanges also serve to hold the said loop-holding thread perfectly taut while the needle-shuttle is returning to its 65 initial starting-point, so that the loop of the weft may be properly held by said loop-holding thread until the slay of the batten has

forced or driven the two weft or woof threads properly in place between the warp-threads.

The selvage-shuttle 49 is adapted to be engaged at one end by the strike-pin 55 at one end of the bell-crank hammer 56. The strike-pin 55 of the hammer 56 is adapted to work within the front end of the front shuttle-box 47 to provide means for driving the side shuttle 49 out of the said box 47 and transversely across the batten through the loop of the weft or woof thread, and the said bell-crank-shuttle hammer 56 is pivotally secured at an intermediate point to the pivot-plate 57, adjustably secured to the front side of the batten 2, adjacent to the box 47, and it will of course be understood that the said shuttle-hammer 56 will have an adjustment corresponding to the box 47, so that these parts 85 will always maintain a proper relative position. The hammer 56 is adjusted by adjusting the pivot-plate 57, which is conveniently attached to the batten by means of a screw or bolt 57^a, passed through a flange of the pivot-plate and engaging in any of a series of perforations 57^b, formed in the batten. The pin 55 at one end of the hammer 56 is normally held out of the box 47 by means of the spring 58, secured to the front side of the batten 95 and pressing against one side of said hammer. At one side of its pivot the hammer 56 is provided with a curved contact end 59, that is disposed within one of the end shuttle-boxes 12 of the batten and is adapted to be engaged by the needle-shuttle when such shuttle is thrown into the said shuttle-box, and in this movement of the needle-shuttle the curved contact end of the hammer will be forced outward, thereby imparting a sharp inward movement to the strike-pin 55, which will forcibly strike against one end of the selvage-shuttle 49 and will drive the said selvage-shuttle out of the box 47 transversely across the batten 2 and into the movable rear shuttle-box 60, arranged in rear of and in direct alinement with the front shuttle-box 47. The said rear shuttle-box 60 is arranged in rear of the batten 2, and is supported in a proper position to provide for the proper movement of the selvage-shuttle 49, and the said rear shuttle-box 60 is essentially rectangular in shape and is open at its front end to receive and eject the selvage-shuttle. The opposite sides of the rear shuttle-box 60 are provided with the flared front ends 61, that assist in properly guiding the selvage-shuttle within the box 60, and the latter is further provided at its opposite inner sides with the oppositely-disposed shuttle-holding springs 62, that press against the opposite sides of the selvage-shuttle 49 to provide for properly holding the same within the box 60. The movable shuttle-box 60 is supported to slide within a stationary rectangular casing 63, that is adjustably supported within the frame 1, adjacent to one side thereof, by means of the sectional adjustable supporting-arms 64, suitably attached to the casing 3 and also to one

side of the machine-frame, said supporting-arms 64 having their separate members adjustably fastened together by means of the screws 64^a.

5 The movable shuttle-box 60 has fitted to the rear closed end thereof a slide-rod 65, that works through the guide-opening 66, formed in one end of the casing 63, and a spring 67 is coiled on the rod 65 between the rear end of
10 the box 60 and one end of the casing 63 to provide for normally moving the box 60 in a forward direction to provide for throwing the selvage-shuttle from the rear shuttle-box across the batten and into the front shuttle-
15 box. The said slide-rod 65 is provided at a point intermediate of its ends and in its upper side with the catch-notch 68, that is normally engaged by the catch-hook 69, formed at one end of the spring trip-wire 70. The
20 spring trip-wire 70 is secured fast at one end, as at 71, to the under side of the stationary casing 63 and is provided with an inclined portion 72, against which works the trip-pin 73, projected from one side of one of the pit-
25 men 3 and providing convenient means for automatically lifting up the free end of the wire 70 and disengaging the catch-hook 69 thereof from the catch-notch of the rod 65, thereby releasing the box 60, so that the same
30 will be thrown sharply forward under the influence of the spring 67. The forward movement of the box 60 is arrested by the stop enlargement 74, formed on the rear end of the slide-rod 65.

35 Referring more particularly to the operation of the two shuttles, it will be assumed that the batten is at the point where it ends its forward movement to force up the weft or woof thread into the warp. When the batten
40 is at this point, the needle-shuttle is within the shuttle-box adjacent to the feeding mechanism for the needle-shuttle, and the selvage-shuttle 49 is located within the rear shuttle-box 60, in which shuttle-box the selvage-shuttle is always at rest when the batten is drawn to
45 the front. With the two shuttles positioned as just stated the batten moves backward to the point to which the rear shuttle-box 60 would extend when released, and when the
50 batten has reached this point the trip-pin 73 will cause the catch-hook 69 to be disengaged from the rod 65, so that the said rear shuttle-box 60 will shoot forward until it comes in contact with the rear side of the rearwardly-
55 moving batten. This movement of the shuttle-box 60 throws the selvage-shuttle 49 across the batten and into the front shuttle-box 47. At the very moment the rear box 60 for the selvage-shuttle strikes the rearwardly-moving batten the needle-shuttle 13 is driven
60 through the shed of the warp and carries a loop of the weft or woof thread through the shed, thereby causing two weft or woof threads to be placed in the warp at one time. In this
65 movement of the needle-shuttle the same comes in contact with the end 59 of the hammer 56 and causes the selvage-shuttle 49 to

be immediately driven back into the rear shuttle-box 60, and in this movement it will be understood that the loop-holding thread 70 52 will be carried through the loop formed between the upper and lower strands of the weft or woof thread 19. It will be understood that the free end of the loop-holding thread 52 has been previously fastened in the
75 box 47, or at some other convenient point at the front side of the batten, before the loom is started, and therefore when the selvage-shuttle has been driven through the loop of the weft and into the rear shuttle-box 60 it
80 will also be understood that the loop-holding thread 52 will be held taut and will therefore hold the loop of the weft while the needle-shuttle returns through the shed on one strand of the weft or woof thread, and until the two
85 weft or woof threads forming the loop have been forced up into place in the warp. At this point attention is directed to the fact that after the selvage-shuttle has been driven through the loop of the weft-thread the
90 needle-shuttle is immediately driven back to its initial starting-point through the same cross of the warp, and therefore it will be seen that the needle-shuttle carries its thread into the warp from one side of the loom only, and
95 after the needle-shuttle has returned to its starting-point the harness of the loom will have made another cross of the warp for the needle-shuttle to repeat the operation already described.

100 The two throws of the needle-shuttle and the selvage-shuttles occur while the batten is moving rearwardly, and after the selvage-shuttle has been thrown back into the box 60, after having been ejected therefrom, it will
105 be obvious that the continued backward movement of the batten will force the box 60 back within the casing 63 until the catch-hook 69 automatically springs into engagement with the notch 68, and thereby locks the
110 rear shuttle-box 60 in its retracted position, ready for another throw forward immediately before the needle-shuttle is moved through the shed from its starting-point.

115 As the weft or filling thread is carried through the shed of the warp by the needle-shuttle 13 the two threads of the loop of the weft are necessarily disposed at an angle to each other, inasmuch as the main batten is on its backward beat or stroke when the loop
120 is carried through the shed of the warp. The angle formed between the two threads of the weft-loop is very plainly illustrated in Fig. 15 of the drawings, and in this connection it will be obvious that in order to make smooth and
125 even cloth it is necessary to force the lower thread of the loop into place between the crossed warp-threads in advance of the upper thread of the loop, which is carried into place by the slay of the main batten. Other-
130 wise both threads of the loop would be packed into place at the same time by the main batten and would produce rough and uneven cloth. To secure the desired result, a false

or supplemental horizontally-swinging batten 76 is employed in connection with the main batten 2. The false batten 76 is arranged to work in the space between the main batten 2 and the breast-beam 77 of the frame 1, and at one extremity the said false batten 76 is provided with a squared spindle 78, which has a sliding fit in the slide-opening 79, formed in the upper end of a short pivot-post 80. The short pivot-post 80 is provided at its lower end with a reduced pivot-stud 81, that loosely fits in the socket 82, formed in the upper end of a supporting-block 83, suitably fastened on the same side of the frame 1 as the thread-feeding mechanism for the needle-shuttle. The construction just described provides a pivotal support for one end of the false batten 76, so as to leave the other end of the false batten free to swing back and forth in the space between the main batten and the breast-beam 77 during the operation of the loom.

The false batten 76 is provided adjacent to its pivotal support with a short spring-section 84, illustrated as consisting of a short spiral or coiled spring, and this spring-section 84 is designed to work under the beveled inner end 85 of a short stationary depressor-arm 86, fastened at its outer end to the breast-beam 77, near one end thereof, and extending inwardly, so as to lie in the path of movement of the spring-section 84 of the batten 76, in order to provide means for depressing the free or unpivoted end of the batten after the lower thread of the weft-loop has been forced up into place, as will be more particularly referred to. At its free or unpivoted end the false batten 76 is provided with the straight angled extension 87, which has fitted on the extremity thereof a segmental slide-button 88, having a lower rounded side 89. The segmental slide-button 88, which is fitted on the free or unpivoted extremity of the false batten, is arranged to work in the grooves of the grooved guide-block 90, located at the side of the frame 1, opposite the pivotally-supported end of the false batten. The grooved guide-block 90 may be either an integral or separate part of the frame 1, and is provided in its inner side with the upper and lower guide-grooves 91 and 92, respectively, which communicate with each other at both ends of the guide-block, and which are separated by means of a dividing-strip 93. The dividing-strip 93 is secured fast only at one end, as at 94, in the grooved side of the guide-block 90, thereby leaving the other end of the strip free to swing up and down under the adjusting influence of the slide-button 88 as the same travels in the grooves 91 and 92, and the said slide-button 88 is properly retained in position in the said grooves by means of a retaining strip or flange 95, secured to the inner face of the guide-block 90 and slightly overhanging the edges of the grooves therein.

The false batten 76 has fitted on the upper side thereof a slay-plate 96. The slay-plate

96 is adjustably connected at both ends, as at 97, with the batten 76, in order that the said plate can be properly adjusted to suit the position of the warp-threads and thereby allow the teeth of the slay-plate 96 to work between said threads without disarranging them. At its inner edge the slay-plate 96 is provided with a series of short upturned teeth 98, which are arranged sufficiently close to correspond with every other reed in the slay 11, carried by the main batten, and the teeth 98 are formed perfectly straight or square, so as to be adapted to pass up between the warp-threads sufficiently far to catch and carry the lower thread of the weft-loop with each forward movement of the false batten 76. This forward movement of the false batten 76 is imparted thereto by means of the retractile spring 99, secured at one end to the front side of the batten 76 at an intermediate point, and at its other end to the breast-beam 77 of the loom-frame. The backward movement of the false batten 76 is given thereto by the movement of the main batten 2, which has a detachable connection with said false batten, which connection will now be described.

The straight angled extension 87, at the free end of the batten 76, is provided with an upwardly-disposed catch-pin 100, that is adapted to be engaged by the shoulder 101 of the shouldered catch-lever 102. The lever 102 is pivoted at an intermediate point, as at 103, to the under side of the main batten 2, near one end thereof, and the shouldered end 101 projects beyond the front edge of the batten 2, so as to readily engage with the catch-pin 100 of the false batten 76. The end of the lever 102, opposite its shouldered or hooked extremity 101, has pivotally connected thereto, as at 104, one end of a trip-lever 105. The trip-lever 105 is also arranged under one end of the main batten 2, and is provided at an intermediate point with an inclined slot 106, which slides over a stationary pin 107, secured in the batten 2. Opposite the pivotal connection 104 the lever 105 is provided with a rounded extremity 108, which projects across the lower side of the slot 15, at one end of the main batten 2, and directly in the path of the picker-stick 14, working in such slot, to provide means for disengaging the catch-lever 102 from the catch-pin 100 at the proper time.

Assuming both of the battens 2 and 76 to be drawn to the limit of their forward movement, the catch-lever 102, carried by the main batten, will be engaged with the catch-pin 100 of the false batten 76, so that the two battens will be locked together. As the main batten now starts on its backward stroke, the free or unpivoted end of the false batten will be carried backward with the main batten, thereby causing the two battens to assume an angle with respect to each other which corresponds to the angle formed between the two threads of the weft-loop which is carried through the shed of the warp. In this movement of the false batten the slide-button 88, at the free

extremity thereof, travels in the lower guide-groove 92 of the block 90, which guide-groove serves to depress the false batten sufficiently far so that the slay-teeth 98 will entirely clear the warp and the weft thread therein, so as to obviate the possibility of the teeth 98 engaging with any thread except at the proper time. After the loop of the weft-thread has been carried through the shed of the warp by the needle-shuttle the slide-button 88 will have reached one end of the lower guide-groove 92, and in passing the unfastened end of the dividing-strip 93 the button 88 forces said unfastened end of the strip 93 upward, so as to allow the button to pass into the space beyond the unfastened end of the strip 93, which thereupon immediately assumes its normal position, so as to prevent the button 88 from returning in the lower groove 92, and causes the same to ride forward in the upper groove 91, which elevates the batten 76 sufficiently far so as to carry the teeth 98 in between the warp-threads and behind the lower thread of the loop which has been carried through the shed of the warp. However, the forward movement of the false batten 76 does not occur until the moment when the picker-stick, at one end of the main batten, strikes the needle-shuttle to drive the same back on the top or upper thread of the loop to its "home-base" or initial starting-point.

At the moment one of the picker-sticks moves in the direction to return the needle-shuttle to its home-base the said picker-stick moves against the rounded extremity 108 of the lever 105 and forces the said lever to one side of the slot 15, and thereby moves the lever 102 on its pivot 103, so as to disengage the shoulder 101 from the catch-pin 100 of the false batten. This operation immediately releases the false batten from the main batten, and the retractile spring 99 sharply draws the false batten to the front. In this forward movement of the false batten, just as the same is released from the main batten, the button 88 immediately rides into the upper guide-groove 91 and thereby elevates the false batten, so as to carry the teeth 98 up between the warp-threads and behind the lower thread of the weft-loop, and the continued forward movement of the false batten, under the influence of the spring 99, causes the lower thread of the weft-loop to be forced up into place between the warp-threads in advance of the upper thread of the loop, which is forced into place by the slay 11 of the main batten. When the false batten reaches the position which is necessary to carry the lower thread of the weft-loop properly into place between the warp-threads, the spring-section 84 of the false batten becomes depressed by the beveled end 85 of the arm 86 and causes the button 88 to drop from the upper groove 91 to the lower groove 92 at the forward ends of such grooves, whereby the false batten will be lowered, so as to disengage the teeth 98 from the threads, and also

so as to be brought to a position out of the way of the main batten, which forces the second or upper thread of the weft-loop into place between the crossed warp-threads. The false batten reaches its forward limit of movement in advance of the time when the needle-shuttle reaches its home-base from the stroke of the picker-stick which released the false batten, and on account of this operation the needle-shuttle on its return movement has only to tighten and hold but the one upper thread of the loop until driven in place by the slay of the main batten. When the false batten has driven its thread in place and has been disengaged therefrom by the means described, the main batten will have reached its forward limit of movement in carrying the second thread of the loop in place, and the shouldered end of the catch-lever 102 will have become automatically engaged with the catch-pin 100 of the false batten, so that both battens will be ready again for the backward stroke or beat together. The automatic engagement of the catch-lever 102 with the pin 100 is effected by means of a spring 109, arranged on the under side of the main batten 2 and bearing at its free end against one end of the lever 102 at the pivotal connection 104.

From the above it is thought that the construction, operation, and many advantages of the herein-described loom will be readily apparent to those skilled in the art without further description, and it will be understood that changes in the form, proportion, and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of this invention.

Having thus described the invention, what is claimed as new, and desired to be secured by Letters Patent, is—

1. In a loom, the combination with the batten; of a needle-shuttle working on the batten; means for actuating the needle-shuttle, a revolving thread-distributing pan supported over one end of the batten and adapted to coil a quantity of thread therein, means for rotating said pan, a thread-spool, means for positively feeding the thread to said thread-pan, and a selvage-shuttle carrying a thread for holding the loop of the weft or woof thread, substantially as set forth.

2. In a loom, the combination with the batten; of the needle-shuttle working on the batten, means for actuating the needle-shuttle, a revolving thread-pan supported horizontally above one end of the batten and provided with a peripheral upturned flange and a perforated central collar to guide the thread to the needle-shuttle, means for rotating said pan, a thread-spool, and means for positively feeding the thread to said thread-pan, substantially as set forth.

3. In a loom, the batten, the needle-shuttle working on the batten, means for actuating the needle-shuttle, a horizontal revolving thread-pan supported to rotate above one end

of the batten and provided with a peripheral upturned flange and a perforated central collar to guide the thread to the needle-shuttle, means for rotating said pan, a conical pan-cover supported above the thread-pan and provided at its lower edge with a vertically-disposed flange disposed within the circle of the flange of the thread-pan, a thread-spool, and thread-feeding rollers feeding a regulated supply of thread to said revolving thread-pan, substantially as set forth.

4. In a loom, the combination with the batten; of the needle-shuttle working on the batten, means for actuating the needle-shuttle, a revolving thread-distributing pan supported to rotate above one end of the batten and provided with a peripheral upturned flange and a perforated central collar to guide the thread to the needle-shuttle, means for rotating said pan, an adjustably-supported conical pan-cover arranged above the thread-pan and provided at its lower edge with a vertically-disposed flange arranged within the circle of the flange of the thread-pan, a stationary tubular thread-guide for guiding the thread into the space between the flange of the thread-pan and the cover therefor, and thread-feeding rollers for positively feeding a regulated supply of thread to the revolving thread-pan, substantially as set forth.

5. In a loom, the batten, the needle-shuttle working on the batten, means for actuating the needle-shuttle, a revolving thread-distributing pan arranged over one end of the batten and adapted to coil a quantity of thread therein, said pan having a central thread-opening, means for rotating said pan, a thread-spool, and a pair of superposed feed-rollers arranged under said thread-spool and adapted to have the thread pass therebetween, and means for positively imparting motion to one of said feed-rollers, substantially as set forth.

6. In a loom, the combination with the batten, the needle-shuttle working thereon and means for actuating the needle-shuttle; of a front shuttle-box rigidly attached to the front side of the batten so as to be carried therewith, a rear shuttle-box supported in a stationary position in rear of the batten in alinement with the front shuttle-box carried thereby, a selvage-thread-carrying shuttle working in a straight line between the front and rear shuttle-boxes and in a plane above the top of the batten, and means for driving the selvage-shuttle out of one shuttle-box into the other and transversely across the top of the batten, substantially as set forth.

7. In a loom, the combination with the batten, a needle-shuttle traveling from end to end of the batten and means for actuating the needle-shuttle; of a front shuttle-box attached to the front side of the batten, a rear shuttle-box supported in rear of the batten in direct alinement with the front shuttle-box means for sharply forcing the rear shuttle-box in a forward direction, a selvage-thread-

carrying shuttle, and means for driving said selvage-shuttle from the front to the rear shuttle-box, substantially as set forth.

8. In a loom, the combination with the batten, a needle-shuttle traveling from end to end thereof and means for actuating the needle-shuttle; of a front shuttle-box attached to the front side of the batten, a rear shuttle-box supported in rear of the batten in direct alinement with the front shuttle-box, a selvage-thread-carrying shuttle, a bell-crank-shuttle hammer pivotally supported at the front side of the batten and provided at one end with a strike-pin working in one end of the front shuttle-box, said bell-crank-shuttle hammer being provided at the end opposite its strike-pin with a curved contact end disposed directly over the batten and adapted to be engaged against by the needle-shuttle, and means for throwing the selvage-shuttle from the rear shuttle-box into the front shuttle-box, substantially as set forth.

9. In a loom, the combination with the batten, and the operating connections for the batten having a trip-pin; of the needle shuttle working on the batten from end to end thereof, means for actuating the needle-shuttle, a front shuttle-box attached to the front side of the batten near one end, a stationary rectangular casing supported in rear of the batten in alinement with said front shuttle-box, a spring-actuated rear shuttle-box sliding in said stationary casing, a catch device for said spring-actuated rear shuttle-box, said catch device being adapted to be engaged by said trip-pin to release the rear shuttle-box, the selvage-thread-carrying shuttle adapted to travel between said front and rear shuttle-boxes, and means for driving the selvage-shuttle from the front to the spring-actuated rear shuttle-box, substantially as set forth.

10. A needle-shuttle for looms consisting of a solid body pointed at both ends and provided in its upper side with a longitudinal thread-groove leading from one end to an intermediate point, an enlarged thread-recess formed in its lower side, bottom thread-grooves leading from each end to said thread-recess, and a thread-eye communicating with said thread-recess and one end of the upper longitudinal thread-grooves, substantially as set forth.

11. In a loom the combination of the main batten, a needle-shuttle traveling on the main batten to carry the weft-thread through the shed in a loop, means for actuating the needle-shuttle a false batten pivotally supported at one end at one side of the main batten and carrying a toothed slay-plate, means for swinging the free end of the false batten, and separate means for raising and lowering the false batten to engage and disengage the teeth of the slay-plate with one of the threads of the looped weft, substantially as set forth.

12. In a loom, the combination of the main batten, a needle-shuttle traveling on the main batten, means for actuating the needle-shut-

tle a false batten pivotally supported at one end in front of the main batten and carrying a toothed slay-plate, a combined lock and releasing device connecting the unpivoted end of the false batten with the main batten, and means for automatically raising and lowering the false batten, substantially as set forth.

13. In a loom, the combination of the main batten, a needle-shuttle traveling on the main batten to carry the weft-thread through the shed in a loop, means for actuating the needle-shuttle a swinging false batten arranged in front of the main batten and carrying a toothed slay-plate adapted to engage with one of the threads of the loop to drive such thread in place between the warp-threads in advance of the other thread of the loop forced into place by the main batten and means for raising and lowering said false batten, substantially as set forth.

14. In a loom, the combination of the main batten, a needle-shuttle traveling on the main batten, means for actuating the needle-shuttle a false batten pivotally supported at one end in front of the main batten and carrying a toothed slay-plate, an automatically-operating combined locking and releasing device connecting the unpivoted end of the false batten with the main batten, and a guide for holding the false batten depressed in its backward movement and elevated in its forward movement, substantially as set forth.

15. In a loom, the combination of the frame provided at one side with a guide-block having in its inner side upper and lower guide-grooves communicating with each other at both ends of the guide-block, the main batten arranged to swing within the frame, a needle-shuttle traveling on the main batten, means for actuating the needle-shuttle a false batten pivotally supported at one extremity at one side of the frame and provided at its opposite free end with a slide-button traveling in the upper and lower grooves of the guide-block, and near its pivoted end with a short spring-section, a short stationary

depressor-arm extended inward from the front of the frame and provided with an inner beveled end lying in the path of movement of the spring-section of the false batten, a toothed slay-plate adjustably fitted on the false batten, a retractile spring connected with the false batten and the front of the frame, and a combined lock and releasing device connecting the unpivoted end of the false batten with the main batten, substantially as set forth.

16. In a loom, the combination with the main batten provided at its ends with picker-stick slots, and the picker-sticks working in said slots; of a needle-shuttle traveling on the main batten, a false batten pivotally supported near one end in front of the main batten and carrying a toothed slay-plate, said false batten also having at its free end an upwardly-disposed catch-pin, a spring connected with the false batten to impart thereto its forward thrust, means for automatically raising and lowering the false batten, a spring-adjusted shouldered catch-lever pivotally mounted on the under side of the main batten near one end and adapted to engage with the catch-pin of the false batten, a stationary pin fitted to the under side of the main batten at one side of one of the picker-stick slots, and a trip-lever pivotally connected at one end to one end of the catch-lever and provided at an intermediate point with an inclined slot working over said stationary pin, said trip-lever being further provided opposite its pivoted end with a rounded extremity normally projected across the lower side of one of the picker-stick slots in the path of the picker-sticks working in said slots, substantially as set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses.

JOHN LLOYD MCKAY.

Witnesses:

B. R. WILLIFORD,
W. H. STOWE.