

E. WALTON.
SLAT WEAVING MACHINE.
APPLICATION FILED JULY 15, 1909.

968,099.

Patented Aug. 23, 1910.

5 SHEETS—SHEET 1.

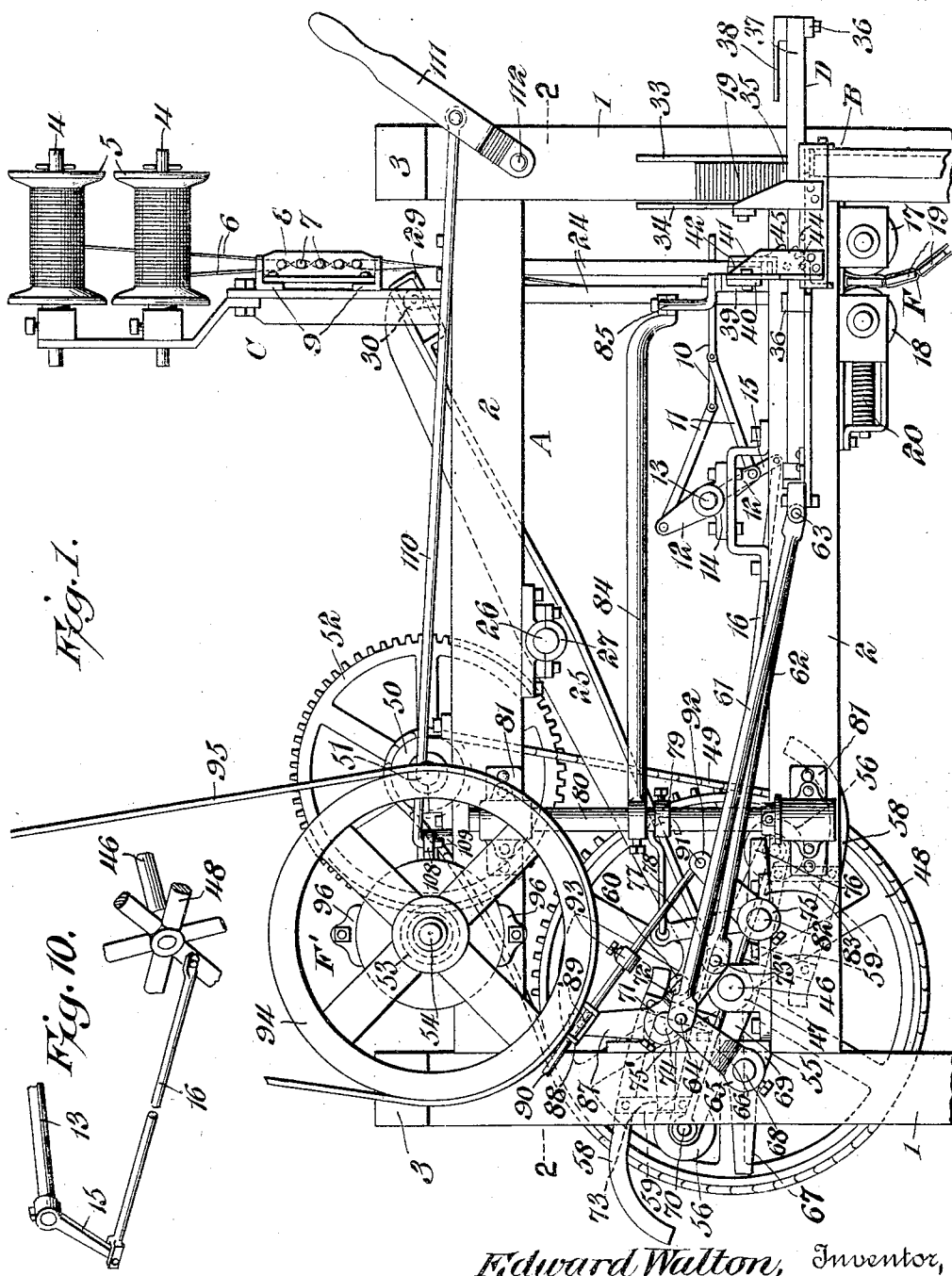


Fig. 1.

Fig. 10.

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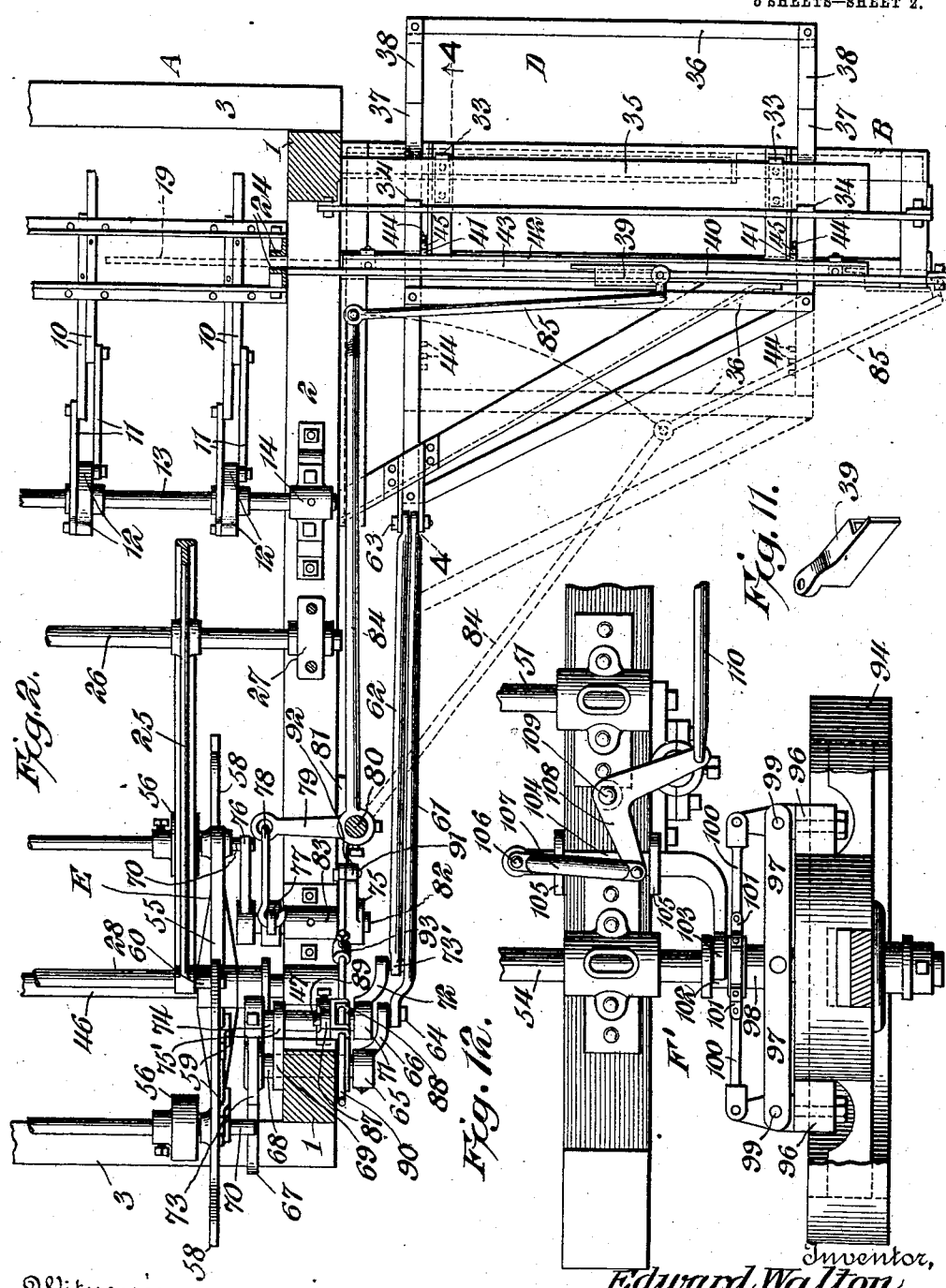
Witnesses
Howard D. Ott.
C. Bradway.

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6 SHEETS—SHEET 2.



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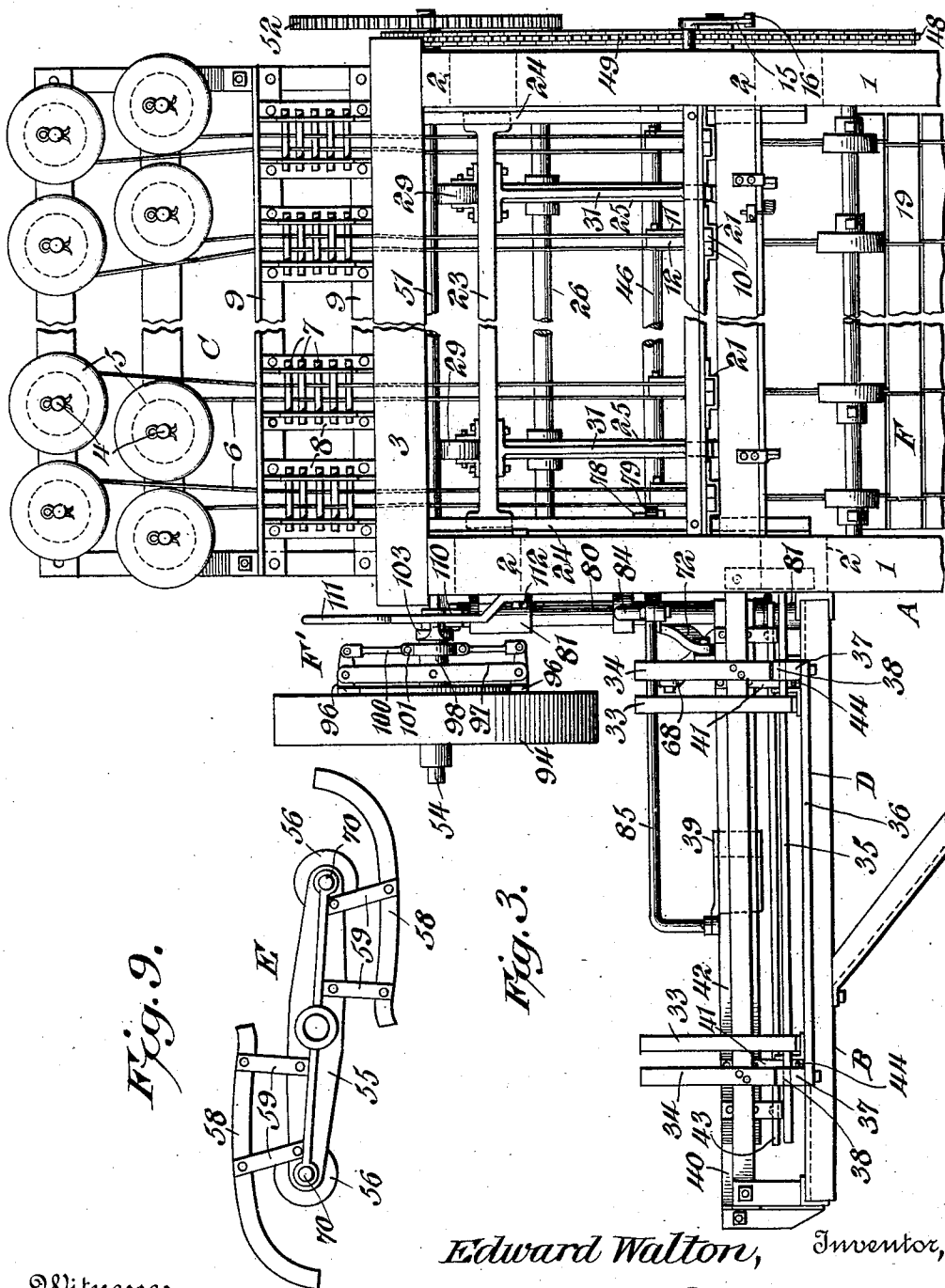
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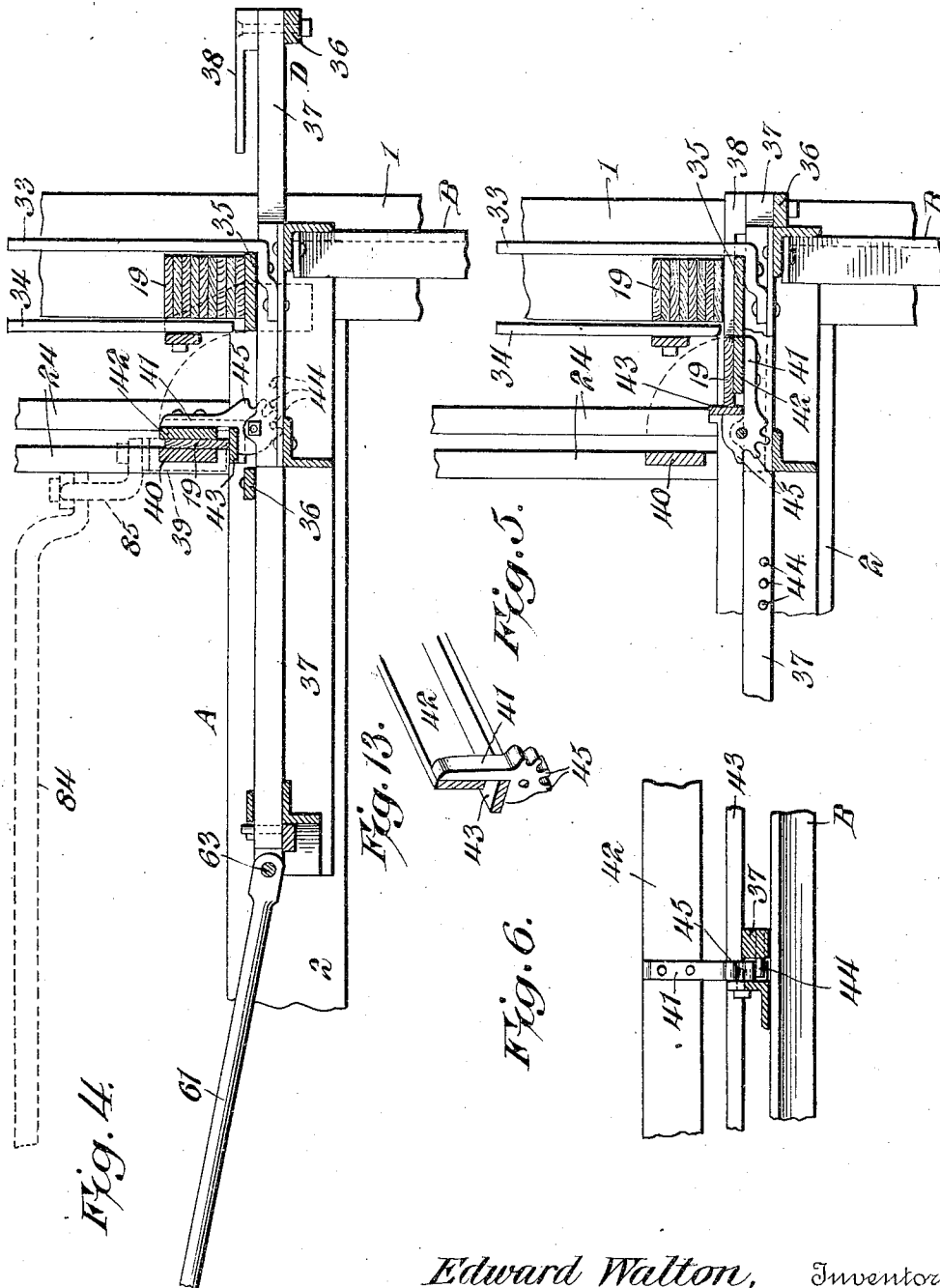
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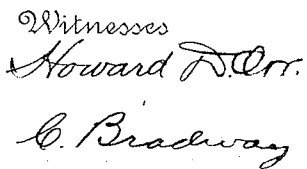


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5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

EDWARD WALTON, OF PENRITH, VIRGINIA, ASSIGNOR TO WALTON PATENT BARREL COMPANY, INC., OF RICHMOND, VIRGINIA, A CORPORATION OF VIRGINIA.

SLAT-WEAVING MACHINE.

968,099.

Specification of Letters Patent. **Patented Aug. 23, 1910.**

Application filed July 15, 1909. Serial No. 507,842.

To all whom it may concern:

Be it known that I, EDWARD WALTON, a citizen of the United States, residing at Penrith, in the county of Cumberland and State of Virginia, have invented a new and useful Slat-Weaving Machine, of which the following is a specification.

This invention relates to slat weaving machines, and more particularly to improvements in machines of that type set forth in United States Letters Patent No. 618,925, granted to me February 7, 1899.

The invention has for its objects to provide a novel mechanism for feeding the slats automatically to the weaving machine, and further to provide a novel and efficient operating means for the said mechanism and for the lay of the weaving machine, and further an improved means for holding the warp wires, and finally a clutch device for throwing the weaving machine into and out of operation.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawings, which illustrate one embodiment of the invention, Figure 1 is a side view of the weaving machine. Fig. 2 is a horizontal section on line 2-2, Fig. 1. Fig. 3 is a front view thereof with portions broken away. Fig. 4 is an enlarged vertical sectional view on line 4-4, Fig. 2, showing the slat feeding mechanism. Fig. 5 is a similar view with portions broken away, and showing the parts in different positions. Fig. 6 is a detail view showing a portion of the slat-elevating means. Fig. 7 is an enlarged elevation of the operating means for the slat-feeding mechanism and lay of the mechanism. Fig. 8 is a similar view, showing the parts in different positions. Fig. 9 is a side view of the rotary actuating device forming part of the means shown in Fig. 7. Fig. 10 is a fragmentary perspective view of the means for operating the rock shaft of the heddles. Fig. 11 is a detail perspective view of the slat-feeding follower. Fig. 12 is a plan

view of the clutch device shown on an enlarged scale. Fig. 13 is a detail view of the elevator of the slat feeding mechanism. Fig. 14 is a fragmentary view of part of the lay-actuating means of the weaving machine.

Similar reference characters are employed to designate corresponding parts throughout the views.

Referring to the drawings, 1 designates the corner standards of the frame A that are connected together by horizontal side and end beams 2 and 3, respectively, and at the front thereof is a side extension or table designated by B for the slat-feeding mechanism. At the rear of the frame A is mounted the operating mechanism for the various parts of the weaving machine.

Rising from the front part of the frame is a spool rack C provided with horizontal spindles 4 on which are mounted the spools 5 for the warp wires 6, the spools being arranged in pairs, one above the other, and grouped side by side, and the wires extending vertically into the weaving machine. Under each pair of spools is a tensioning device consisting of rods 7 arranged one above the other and mounted in bearing members 8 secured to cross bars 9 at the base of the spool rack, and the wires are intertwined with the rods so as to provide the desired tension. The wires extend downwardly from the tensioning devices and are passed through heddle bars 10 arranged in pairs to correspond with the "runs" of the warp wires, and each pair of heddles are connected by links 11 with oppositely disposed arms 12 on a rock shaft 13, the rock shaft being mounted in bearings 14 on the lower side beams of the main frame A and being equipped at one end with a crank arm 15 operatively connected with a pitman 16. By means of the heddles, the shed is provided for receiving the slats forming the woof of the fabric woven by the machine. Disposed under the heddles are front and rear sets of fabric-engaging rolls 17 and 18, so arranged as to engage the warp wires of the fabric F to compress the wires against the slats 19. The rear set of rolls are tensioned by spring means 20, Fig. 1, toward the front rolls, so as to produce the com-

pression of the wires. By arranging the feed spools and tensioning devices C directly above the heddles in the manner set forth, a more direct pull is obtained on the wires than in my prior patent. As shown in Fig. 3, each pair of heddles is slidably mounted in bearings 21 carried by the shed arranged at the front of the machine.

The lay for feeding the fabric and driving the slats into position close to each other consists of a cross head 23, Fig. 3, which has its ends slidably mounted in vertical guides 24 carried by the side beams 2 of the machine, the guides being formed of bars spaced apart to accommodate the extremities of the cross head. This cross head is connected with an oscillatory frame composed of a pair of beams 25 arranged longitudinally between the side beams of the frame and mounted on a horizontal shaft 26 journaled in bearings 27 carried by the upper side beams, as shown in Fig. 1, one beam being disposed behind the other in this figure, so that only one is visible. The rear ends of the beams 25 are connected together by a cross bar 28 shown in Figs. 2 and 3 so as to insure simultaneous movement of the beams. The front ends of the oscillatory beams 25 are provided with yokes 29 which engage rollers 30 mounted on the upper side of the cross head 23 of the lay. The cross head carries depending push bars 31 that are so disposed as to engage the uppermost slat of the fabric when the lay is moved to feeding position so as to properly position the said slat and finally move the fabric one step forwardly.

Arranged on the table B is a horizontally-disposed reciprocatory carrier designated generally by D that operates to remove the lowermost slat from the holder for the pile of slats. The holder comprises upright members 33 and 34 mounted on the table B so as to engage the front and rear edges of the slats 19 when arranged in a pile, as shown in Fig. 1. The rear members or standards 34 are spaced above the bottom plate or platform 35 of the pile holder, so that the lowermost slat can be moved rearwardly from under the said standards. The two pairs of standards are spaced from each other so as to engage the slats of the pile adjacent the ends and the slats are adapted to rest horizontally one on another. The function of the carrier D is to remove the lowermost slat and deposit the same on an elevator which changes the slat to be fed to a vertical position and at the same time brings it into coöperative relation with a laterally-movable slat feeder which carries the slat to weaving position. The carrier D is in the form of a rectangular frame composed of front and rear bars 36 and side bars 37, and on these side bars 37 are slat-engaging fingers 38 which, as the carrier

moves rearwardly, engage the lowermost slat of the pile and carry it out of the pile holder.

The means for feeding the slats to weaving position comprises a follower 39 which reciprocates on a horizontal guide rail 40 disposed behind the slat holder and approximately in the plane of the woven fabric. The follower 39 engages the outer end of the slat fed to it and moves the said slat laterally between the spaced angle bars 24 forming a guide for the lay. The guide rail 40 also constitutes a rest to which the slat is conveyed by means of a swinging elevator arranged between the slat pile holder and rest, the elevator serving to throw the slat from a horizontal to a vertical position. This elevator comprises a pair of swinging arms 41 pivotally mounted on the side bars 37 of the slat carrier D, and on these arms are arranged bars 42 and 43 disposed at right angles to each other to form a shelf which, when in lowered position as shown in Fig. 5, will receive the lowermost slat ejected from the pile holder by the fingers 38, the bar 42 being so arranged as to lie flush with the bottom plate 35 of the pile holder, while the bar 43 forms an abutment against which the slat strikes in its ejecting movement. After the slat is thus placed, as shown in Fig. 5, the elevator is actuated to swing through an angle of ninety degrees to bring the slat into alinement with the laterally-movable slat placer or follower 39. The elevator is operated automatically by the movement of the carrier D. For this purpose, the side bars 37 of the carrier have inwardly extending teeth in the form of spaced pins 44 which are adapted to mesh with teeth 45 on the arms 41 of the slat elevator. These pins are so disposed that when the carrier reaches the end of its movement to the right, Figs. 1, 2 and 4, the carrier will swing downwardly to slat-receiving position and at the end of the movement in the opposite direction, the elevator will be moved upwardly to slat-placing position. The follower or slat placer 39 is moved in timed relation with the slat carrier and elevator so that the slats are fed successively to weaving position in rapid order.

The lay of the weaving machine and the slat carrier, elevator and feed follower are operated from a single drive shaft by a series of cams, levers or the like, so arranged as to operate the weaving machine and slat-feeding mechanism in timed relation. In Figs. 1, 2, 7 and 8, is disclosed an approved form of operating mechanism in which 46 is the rotary drive shaft which extends transversely to the frame A and is mounted in bearings 47 on the lower side beams 2. On the side of the weaving machine opposite from the slat-feeding mechanism, the shaft 46 is provided with a large sprocket wheel 48, Fig. 1, around which passes a sprocket

chain 49 meshing with a small sprocket wheel 50 on a secondary shaft 51, which shaft is provided with a gear wheel 52 meshing with a pinion 53 on the main drive shaft 54 of the machine. Mounted on the shaft 46 are a pair of lay actuators designated generally by E, one of which is shown detached in Fig. 9. Each actuator consists of a lever 55 having rollers 56 at opposite ends which are adapted to successively engage under the rear end of each oscillatory beam 25 of the lay, such rear end being curved upwardly to form cam faces 57 over which the rollers ride in raising the rear ends of the beams and thus depressing the lay. Each arm of the lever 55 is provided with a rail-like shoe 58 arranged at opposite sides of the lever and supported on their respective arms by connecting members 59. The shoes are spaced from the rollers and the outer ends are curved slightly over the latter. These shoes are adapted to engage lateral projections 60 carried by the rear ends of the oscillatory beams 25 for the purpose of drawing the latter downwardly to retract the lay, the said projection being preferably formed by extending the transverse shaft 28 which connects the lay beams or members 25 together. As the actuator E revolves, a roller 56 moves into engagement with the under face of the adjacent beam 25 for producing an upward movement from the position shown in Fig. 8 to that shown in Fig. 7. As the actuator continues to revolve in an anti-clockwise direction, the roller 56 will gradually ride from under the member 25, and while so doing, the shoe 58 adjacent said roller will be projected over the projection 60 and cause the member 25 to be lowered as the rotation of the actuator continues, this lowering movement being effected by reason of the more or less parallel relation of the shoe with the radius of the lever 55. In Fig. 8, the heel of the shoe is about to leave the projection 60 so that the member 25 can be moved upwardly by the succeeding roller of the actuator E. It will thus be seen that each roller and companion shoe coöperates to raise and lower the lay, imparting two strokes to the latter for each revolution of the actuator.

The slat carrier D is reciprocated by a pair of pitmen 61 and 62 which operate, respectively, as pull and push rods for reciprocating the carrier. The forward ends of the rods are connected by a common pivot 63 with the rear portion of the carrier D, as clearly shown in Fig. 12. The pull rod 61 has its rear end pivotally connected at 64 with a bell crank lever 65 which consists of a pair of arms 66 and 67 connected by a stub shaft 68 that rocks in a bearing 69 on one of the rear uprights of the frame A, as shown in Figs. 1 and 2. The pull rod 61 is connected with the outer arm 66 of the bell

crank lever, while the inner arm 67 is located in the arc of movement of projections 70 on one of the actuators E, which projections are preferably extensions of the axles for the rollers 56. The arm 61 is approximately in a horizontal position when it is engaged by the projection 70, as shown in Fig. 1, and is moved to an approximately vertical position, as shown in Fig. 7, when the projection leaves the arm, the lever 65 having a swing of about ninety degrees for moving the slat carrier D on its rear stroke to eject a slat from the slat holder to the slat elevator. The forward stroke of the slat carrier is produced by the bell crank lever 71 which has an arm 72 hingedly connected at 73' with the push-rod 62. The other arm 73 of the bell crank lever is fastened to a stub shaft 74 mounted in a bearing 75' on the main frame in such a position as to extend upwardly to be in the path of the projection 70 at the opposite end of the rotary element or lever 55 from that projection that has just produced the rear stroke of the slat carrier, as shown in Fig. 7. The upper projection 70 moves through an arc of about thirty degrees, more or less, before it strikes the arm 73 after the lower projection 70 leaves the arm 67 of the lower bell crank lever. As the element 55 continues to rotate after engaging the arm 73, the bell crank lever 71 will be moved in an anti-clockwise direction to thereby move the slat carrier to the right or forwardly through the rod 62. During the time the upper pin 70 moves from the position shown in Fig. 7 to position for engaging the arm 73, the lay of the weaving machine is actuated and the slat feeding mechanism is idle.

As soon as the carriage has reached the limit of its forward stroke, which means that the swinging slat elevator has positioned a slat in front of the laterally-movable follower 39, the lower pin 70 has traveled through the arc indicated by dotted lines, Fig. 7, and is brought into co-action with the means for operating the follower 39. For this purpose, a third bell crank lever 75 is employed which consists of a downwardly-extending arm 76 arranged to be engaged by the lower pin 70 and an upwardly-extending arm 77 which is connected by a link 78 with a horizontally swinging arm 79 on a vertical rock shaft 80 which, as shown in Fig. 1, is mounted in bearings 81 on the side beams of the frame. The arms 76 and 77 are attached to a rock shaft 82 forming a part of the bell crank lever 75 and which is mounted in a bearing 83 on one of the lower side beams of the frame. The vertical rock shaft 80 is provided with a comparatively long forwardly-extending arm 84 which connects, by means of a link 85, with the slat feeding follower 39, as clearly shown in Figs. 1 and 2, the arm 84

and link 85 forming a toggle joint between the follower and rock shaft 80. In Fig. 2, the follower is shown approximately in its mid-position in the act of feeding a slat into weaving position, and when the follower is entirely retracted, the parts are in the dotted line position. In Fig. 7, the lever 75 is in its normal position, and in Figs. 1 and 8, the lever is in the act of turning in an anti-clockwise direction so as to swing the arm 79, Fig. 8, as indicated by the arrow, with the result that the follower is moving to place the slat in weaving position. The return movement of the follower 29 is effected through connections between the levers 71 and 75. For this purpose, the lever 71 is provided with a third arm 87 which carries a yoke 88 pivoted at 89 on the said arm and through which slides a rod 90 which has one end pivoted at 91 on a third arm 92 connected with the shaft 82 of the bell crank lever 75. On the rod 90 is an adjustable stop 93 with which the yoke 80 engages to oscillate the lever 75 in a direction to return the slat-feeding follower 39 to initial or slat-receiving position. During the feeding movement of the follower 39, the slat carrier D is idle and the yoke-carrying arm 78 of the lever 71 is in a vertical position, as shown in Fig. 1. It will be observed that the stop 93 is moving toward the yoke 88 as the follower 39 is feeding the slat and the slat will have reached weaving position when the stop, in its upward movement, strikes the yoke. As soon as the projection 70 at the left of Fig. 1, engages the arm 67 to effect the return movement of the slat carrier D, the arm 87 that carries the yoke 88 will be moved in a clockwise direction so as to act through the stop 93 and rod 90 to tilt the bell crank lever 75 in a direction to move the follower 39 outwardly to its dotted line position, Fig. 2. It will thus be seen that between the levers 71 and 75 is a lost motion connection whereby the first lever operates the second during the return or rear stroke of the carrier D, while the second lever has no effect on the first during the movement of the slat moving follower. By adjusting the stop 93, the movements can be accurately timed so that all the parts work in harmony.

The machine may be driven in any approved manner, as for instance, by a belt transmission. On the main shaft 54 is a pulley 94 which passes a belt 95, and this pulley is operatively connected with the main shaft 54 by a clutch designated F' and which is shown in Figs. 3 and 12. This clutch comprises a pair of oppositely-disposed shoes 96 carried by one or more cross pieces 97 fastened to a sleeve 98 on the shaft 54. The shoes are fulcrumed at 99 on the said cross pieces and are simultaneously actuated by links 100 pivotally connected

to the lug 101 on the sleeve 98. This sleeve has at its inner end an annular groove 102 in which engages the bifurcated end 103 of a shipper or actuating rod 104 slidable in bearings 105 on the frame of the machine. The inner end of the member 104 is pivotally connected at 106 with a link 107 extending approximately parallel with and over the member 104 and is connected with a bell crank lever 108 fulcrumed on the frame at 109. This bell crank lever has one arm connected with a longitudinally-movable rod 110 that extends to the forward part of the machine and is connected with a handle-operating lever 111 fulcrumed at 112 on the front part of the frame. By manipulating the lever 111, the clutch can be opened or closed for throwing the power on or off the machine.

From the foregoing description, taken in connection with the accompanying drawings, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the apparatus which I now consider to be the best embodiment thereof, I desire to have it understood that the apparatus shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

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

1. A slat weaving machine including a lay, heddles for the warp, and fabric drawing off means, in combination with a slat-feeding element having a range of movement to move each slat its full length to weaving position, a slat holder disposed along the path of movement of the element and to one side thereof, means movable transversely to the slats in the holder for removing the lowermost slat therefrom, and a device disposed between the holder and the path of movement of the element to bodily carry the slat removed from the holder to a position in front of the element when the latter is at the end of its return movement.

2. In a slat weaving machine including a lay, heddles for the warp strands, and fabric drawing off means, with a slat feeding mechanism including a reciprocatory follower for moving the slats singly into weaving position, means for moving the follower a distance substantially equal to the length of the slat, a holder for a pile of slats, a reciprocatory carrier movable transversely to the pile for removing the slats one at a time from the holder, and a movable device arranged to receive the slats from the carrier and convey them to the follower.

3. A slat feeding attachment for weaving

machines comprising a fixed device for holding a pile of slats, a reciprocatory carrier movable under the pile for removing the lowermost slat therefrom, and a reciprocatory device for moving the slat longitudinally to weaving position.

4. A slat feeding mechanism of the class described comprising a fixed device for holding a pile of slats, a carrier movable back and forth to eject the lowermost slat from the pile in a lateral direction, a device for feeding each slat to weaving position, a conveyer arranged to transfer the slat to the said device after ejection from the pile holder, and means for operating the carrier, conveyer and device in successive order.

5. A slat feeding mechanism for weaving machines comprising a reciprocatory slat feeder, a swinging conveyer arranged to receive slats successively from the carrier and operated by the latter, and a device for receiving the slats successively from the conveyer to feed the slats to weaving position.

6. A slat feeding mechanism for weaving machines comprising a device for holding a pile of slats, a carrier movable back and forth in coöperative relation with the holder for removing slats successively therefrom, a reciprocatory device movable transversely to the carrier for feeding slats successively to weaving position, and means for transferring the slats from the carrier to the said device.

7. A slat feeding mechanism for weaving machines comprising a reciprocatory carrier, slat-engaging fingers mounted thereon, a device for holding a pile of slats in coöperative relation with the fingers whereby the slats are ejected successively from the device, a swinging conveyer arranged to elevate the slats received from the device, and means for receiving the slats from the conveyer and moving them to feeding position.

8. A mechanism for feeding slats to a weaving machine comprising a carrier, means for holding a pile of slats, means on the carrier for removing slats from the holder successively, a swinging elevator arranged to receive the slats from the holder, a rest against which each slat is held by the elevator when the same reaches the end of its movement, and means movable along the rest for carrying the slats to weaving position.

9. A slat feeding mechanism comprising a swinging slat carrying means, a device for feeding slats successively thereto, a fixed rest arranged to receive the slat from the said means, and a reciprocatory follower movable along the rest and arranged to receive the slats for moving the slat to weaving position.

10. A mechanism for feeding slats comprising a rail, a reciprocatory follower movable along the rail for feeding slats suc-

cursively to weaving position, and means for successively feeding slats into coöperative relation with the follower.

11. A mechanism for feeding slats comprising a follower, a rest along which the follower moves and on which the slat slides longitudinally, and a device for successively receiving slats in a horizontal position and conveying while bodily supporting them to the rest in a vertical position in the path of the follower.

12. A slat feeding mechanism comprising a follower, a rail on which the follower reciprocates, a swinging elevator pivoted below the rail and arranged to receive a slat horizontally and deliver it vertically to the follower, and means for delivering slats successively to the elevator.

13. A slat feeding mechanism comprising a rest, a follower movable along the same, a swinging elevator arranged to convey a slat to the rest at a point in front of the follower to be placed by the latter in weaving position, means for feeding slats successively to the elevator, and operating connections between the said means and elevator moving the latter periodically by the former.

14. A slat feeding mechanism comprising a rail, a follower carried by and movable longitudinally on the rail, a swinging elevator arranged to receive a slat horizontally and conduct it to a position flat against the rail and in front of the follower to be moved thereby, a reciprocatory device for feeding slats successively to the elevator, and means for swinging the elevator upwardly as the said device moves in one direction and downwardly as the latter moves in the opposite direction.

15. A slat feeding mechanism comprising a slat holder including a bottom plate and standards for holding a pile of slats, a reciprocatory element including a finger movable across the bottom plate to eject a slat from the holder, and a device for moving the ejected slat longitudinally to weaving position.

16. A slat feeding mechanism comprising a holder in which the slats are arranged in a pile one above another in horizontal position, means for ejecting the slats laterally from the holder, and a device for moving the ejected slat longitudinally to weaving position.

17. A slat feeding mechanism comprising a holder in which the slats are arranged in a pile one above another in horizontal position, means for ejecting the slats laterally from the holder, a device for moving the ejected slat longitudinally to weaving position, and means between the follower and holder for conducting the slats successively to the follower.

18. A slat feeding mechanism comprising a device for holding slats horizontally in a

pile, means for ejecting the slats laterally in horizontal position, means for receiving the slats ejected from the device and transferring them to a vertical position, and a reciprocatory element for moving the vertically placed slats to weaving position.

19. A slat feeding mechanism comprising a reciprocatory follower, a support therefor, a device spaced from the support for holding a pile of slats, a swinging elevator disposed between the holder and support for transferring a slat from one to the other, said elevator comprising a plurality of arms and bars carried thereby to receive a slat, and a common means for ejecting the slats from the holder and for operating the elevator after the ejected slat is placed thereon.

20. A slat feeding mechanism comprising a reciprocatory device for moving slats successively to weaving position, means for supplying slats thereto, a device for directly actuating the follower in one direction, and actuating means for the first-mentioned means and serving to move the follower in the opposite direction.

21. A slat feeding mechanism comprising a reciprocatory element for moving slats successively to weaving position, a reciprocatory device for feeding slats successively to the element, actuating means for the said device, means for actuating the element in forward position to place a slat, and a connection between the operating means for returning the element by the operating means for the said device.

22. A slat feeding mechanism comprising a reciprocatory follower, means for operating the same to feed a slat to weaving position, a reciprocatory carrier for feeding slats to the follower, means for reciprocating the carrier, and a connection between the operating means for permitting the follower to move on its feeding stroke and for operating the follower on its return stroke by the second means.

23. In a slat feeding mechanism, the combination of a reciprocatory device for longitudinally feeding slats successively to weaving position, a rock shaft, a swinging arm thereon, a link connecting the outer end of the arm with the device, and means for periodically rocking the shaft.

24. In a slat feeding mechanism, the combination of a reciprocatory device for feeding slats successively to weaving position, a rock shaft, an arm thereon, a link connecting the arm with the device, means for periodically rocking the shaft, a device for successively feeding slats to the element, an actuator for the device, operating connections between the actuator and rock shaft for moving the element in one direction, and means for rocking the shaft while the actuator is idle for moving the element in the opposite direction.

25. A slat feeding mechanism comprising a reciprocatory element for feeding slats to weaving position, a reciprocatory device movable transversely to the element for supplying slats successively thereto, actuating means for the device including alternately acting pitmen for reciprocating the same, and means for operating the pitmen alternately.

26. A slat feeding mechanism comprising a reciprocatory element for feeding slats to weaving position, a reciprocatory device movable transversely to the element for supplying slats successively thereto, actuating means for the device including alternately acting pitmen for reciprocating the same, means for operating the pitmen alternately with a period of rest between them, means for actuating the element in one direction during the time the pitmen are idle, and means for returning the follower while the pitmen are moving.

27. A slat feeding mechanism comprising a slat holder, means for feeding slats to weaving position, a reciprocating element for supplying slats to the said means, a device for moving the element in one direction, a separate device for moving the element in the opposite direction, and a common actuator for the devices.

28. A slat feeding mechanism comprising a slat holder, means for feeding slats to weaving position, a reciprocatory element for supplying slats to the said means, a device for moving the element in one direction, a separate device for moving the element in the opposite direction, an actuating device for the said means, and a common actuator for the devices.

29. A slat feeding mechanism comprising means for feeding slats to weaving position, a device for supplying slats successively to the said means, separate oscillatory elements, pitmen connecting the elements with the said device, and an actuator arranged to successively engage the elements for actuating the device.

30. A slat feeding mechanism comprising a reciprocatory slat feeder, a device for supplying slats thereto successively, operating means for the said feeder, a rotary element operating through the said means to actuate the feeder in one direction, actuating means operated by the said element for actuating the said device, and operating connections between the last-mentioned means and first-mentioned means to move the feeder in the opposite direction.

31. A slat feeding mechanism comprising a reciprocatory device for feeding slats to weaving position, a reciprocatory device for supplying slats to the first device, separate elements connected with the second device for reciprocating the same, an element connected with the first device for moving the

latter in one direction, and a lost motion connection between the last-mentioned element and one of the first-mentioned elements whereby the latter moves the first device in the other direction.

32. A slat feeding mechanism comprising a device for feeding slats to weaving position, a device for supplying slats thereto, separate bell crank levers operatively connected with the second device for reciprocating the same, a rotary element successively operating the levers, and means actuated by the said element for operating the first device in timed relation to the second.

33. A slat feeding mechanism comprising a device for feeding slats to weaving position, a device for supplying slats thereto, separate bell crank levers operatively connected with the second device for reciprocating the same, a rotary element successively operating the levers, a bell crank lever operated by the element to move the first device forwardly to feed a slat, and means between the last-mentioned bell crank lever and one of the first to be actuated thereby for returning the slat-feeding device to initial position.

34. A slat feeding mechanism comprising a slat feeding device, means for supplying slats successively thereto, a plurality of elements for actuating the device and means, a rotary member arranged to successively engage the elements, and a lost motion connection between the elements.

35. A slat feeding mechanism comprising a device for feeding slats to weaving position, a device for supplying slats to the first device, actuating means for the second device, a member operatively connected with the first device for moving the same, a rotary element periodically engaging the member for moving the same in a direction to actuate the first device on its feeding stroke, and operating connections between the member and said means for permitting the latter to move independently of the member during a portion of the movement of the second device and whereby the said means operates through the said connections to move the first device on its return stroke during another portion of the movement of the second device.

36. A slat feeding mechanism comprising a device for feeding slats to weaving position, a device for successively supplying slats thereto, operating means for the last-mentioned device including a swinging arm, means connected with the first device for moving the same during its feeding stroke and including a swinging arm, and a rod attached to one of the arms and movably connected with the other arm to constitute a lost motion connection between the said means, whereby the first operates through

the second to return the slat feeding device to initial position.

37. A slat feeding mechanism comprising a device for feeding slats to weaving position, a device for supplying slats successively thereto, separate means for actuating the devices and each including a swinging arm, a common actuator for the said means, a rod hingedly connected with one of the arms and slidably connected with the other arm, and an adjustable stop on the rod arranged to operate with the last-mentioned arm to cause simultaneous movement of the arms through the said rod.

38. A slat feeding mechanism comprising a reciprocatory slat feeding device, a device for supplying slats thereto, operating means for the first device including a rocking element, means for operating the second device including a rocking element, a rotary actuator common to both means, a rod hingedly connected with the first element, a yoke on the second element in which the rod slides, and a stop on the rod arranged to engage the yoke to permit the second element to operate the first for moving the reciprocatory feed device on its return stroke and to permit the first element to move independently of the second on the feed stroke of the reciprocatory device.

39. A slat feeding mechanism comprising a slat feeding device, a device for supplying slats thereto, a plurality of rocking elements, connections between two of the elements and the second device, connections between the third element and the first device, and a common actuator for operating the elements in timed relation to effect a continuous feed of slats.

40. A slat feeding mechanism comprising a slat feeding device, a device for supplying slats thereto, a plurality of rocking elements, connections between two of the elements and the second device, connections between the third element and the first device, a common actuator for operating the elements in timed relation to effect a continuous feed of slats, and a lost motion connection between the third element and one of the others whereby the latter operates the former during the return stroke of the slat feeding device.

41. A slat feeding mechanism comprising a reciprocatory follower for feeding slats to weaving position, a swinging arm, a link connected with the arm and follower, a rocking element connected with the arm for oscillating the same, a second rocking element, a lost motion connection between the elements whereby the second operates the first to effect the return of the follower, and means for operating the said element.

42. A slat feeding mechanism comprising a reciprocatory follower for feeding slats to weaving position, a swinging arm, a link connected with the arm and follower, a

rocking element connected with the arm for oscillating the same, a second rocking element, a rod connected with the first element, a yoke hingedly mounted on the second element and in which the rod slides, a stop on the rod arranged to be engaged by the yoke for moving the first element by the second for effecting the return movement of the follower, and means for operating the first element to effect the forward movement of the follower and thereafter to actuate the second element.

43. In a slat feeding mechanism, the combination of a rotary element, a plurality of bell crank levers mounted eccentrically to the element and on separate pivots, projections on the element arranged to successively engage an arm on each lever, a slat supplying device connected with the levers to be reciprocated thereby, and means for receiving slats from the said device and feeding them to weaving position.

44. In a slat feeding mechanism, the combination of a rotary element, a plurality of bell crank levers mounted eccentrically to the element and on separate pivots, projections on the element arranged to successively engage an arm on each lever, a slat supplying device connected with the levers to be reciprocated thereby, means cooperating with the device for feeding slats to weaving position, and operating connections between the said element and means for actuating the latter.

45. A slat feeding mechanism comprising a rotary element, three bell crank levers spaced from the axis of rotation of the element and having outwardly extending arms, a projection on the element arranged to successively engage the arms, slat feeding and supplying devices, and operating connections between the devices and bell crank levers.

46. A slat feeding mechanism comprising a rotary element, three bell crank levers spaced from the axis of rotation of the element and having outwardly extending arms, a projection on the element arranged to successively engage the arms, a reciprocatory slat feeding device, a connection between one of the levers and device for moving the latter during its feeding stroke, a device for supplying slats to the first-mentioned device, operating connections between the other two levers and second device for actuating the same, and operating connections between the lever for the slat feeding device and one of the other levers to move the slat feeding device on its return stroke.

47. In a slat weaving machine, the combination of a lay actuator, a slat feeding device operated by the lay actuator, and means operated by the said actuator for successively supplying slats to the feeding device.

48. In a weaving machine, the combination of a rotary lay actuator, a reciprocatory device for feeding slats to weaving position, operating means between the actuator and device for reciprocating the latter twice during each revolution of the actuator, a reciprocatory device for supplying slats to the feeding device, and operating means between the actuator and last-mentioned device for reciprocating the latter twice during each revolution of the actuator.

49. In a slat weaving machine, the combination with a lay, a rotary element for actuating the same, a device for feeding slats to weaving position, a device for supplying slats to the first-mentioned device, operating means for the said devices, and means carried by the actuator for operating the said devices in timed relation to the first-mentioned means.

50. In a slat weaving machine, the combination of a lay including a swinging beam, projections on the beam, a rotary element successively engaging the beam for moving the same in one direction, and shoes carried by the element to engage the projection of the beam for moving the latter in the opposite direction.

51. In a slat weaving machine, the combination of a lay including a swinging beam, a projection thereon, a shaft, oppositely-disposed arms on the shaft, rollers on the extremities of the arms for successively engaging the beam to raise the same, and shoes carried by the arms for successively engaging the said projection to lower the beam.

52. In a slat weaving machine, the combination of a lay including a swinging beam, a projection thereon, a shaft, oppositely-disposed arms on the shaft, rollers on the extremities of the arms for successively engaging the beam to raise the same, shoes carried by the arms for successively engaging the said projection to lower the beam, a slat feeding mechanism, and means carried by the arms for operating the said mechanism.

53. In a slat weaving machine, the combination of a frame, a lay, a fabric draw-off device mounted on the frame, a spool rack mounted on the frame in upstanding position, tensioning devices for the warp strands arranged below the spools on the rack and above the lay, heddles for actuating the warp strands, and an automatically-operated slat feeding device mounted on the frame at one side thereof for successively supplying slats between the warp strands.

54. In a weaving machine, the combination of a frame, an upstanding rack thereon, spools mounted on the rack for holding the warp wires, tension devices mounted on the rack at points below the spools through

which the warp wires pass, a fabric draw-off device mounted on the frame, heddles connected with the warp wires, means for actuating the heddles, a lay mounted on the
5 frame, means for actuating the lay, and a mechanism for automatically feeding slats to weaving position.

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

EDWARD WALTON.

Witnesses:

PERRY SEAY,
JAS. H. FRASER.