July 27, 1926. 1,593,980

W. J. LUTTON

LOOM

Filed Jan. 21, 1925 3 Sheets-Sheet 1

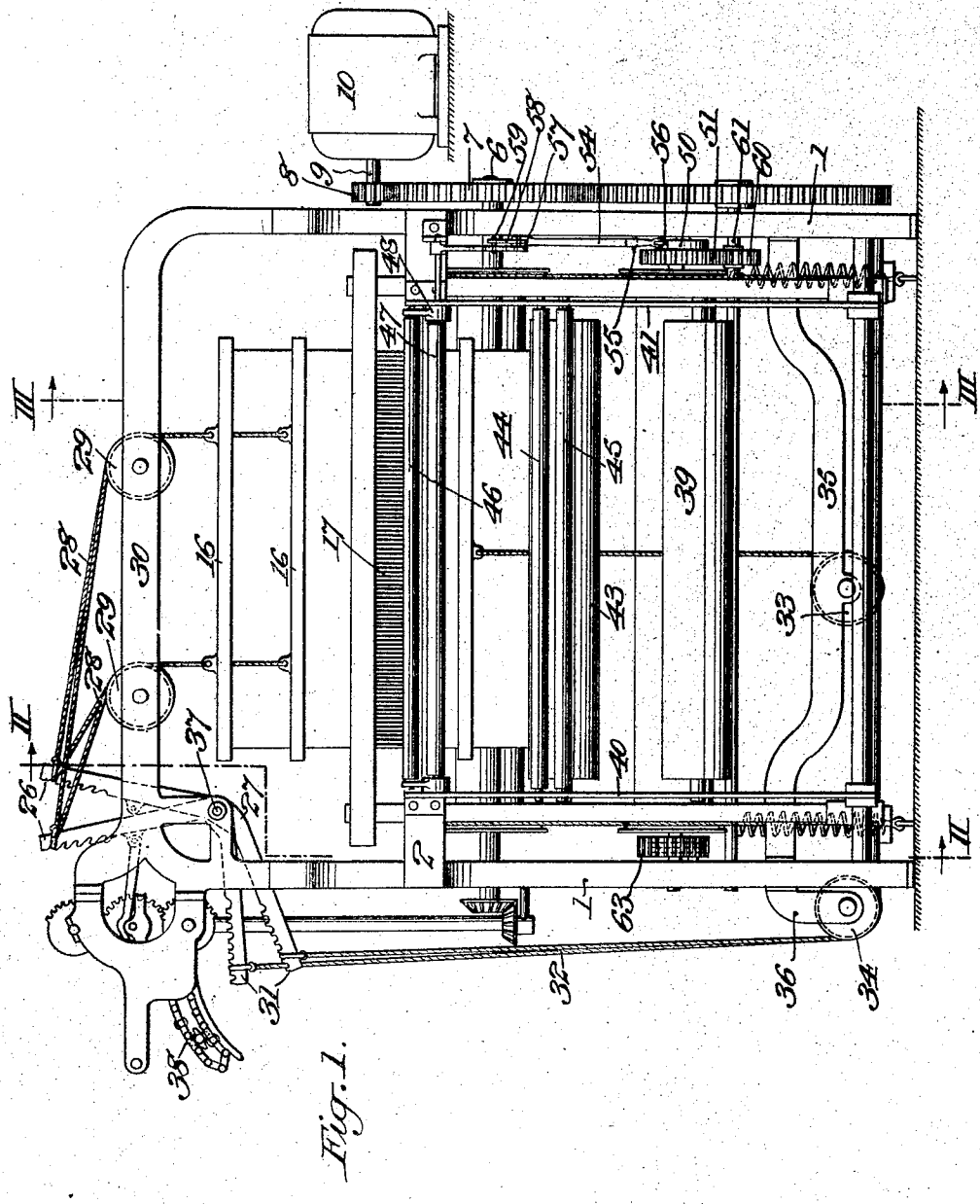


Fig. 1.

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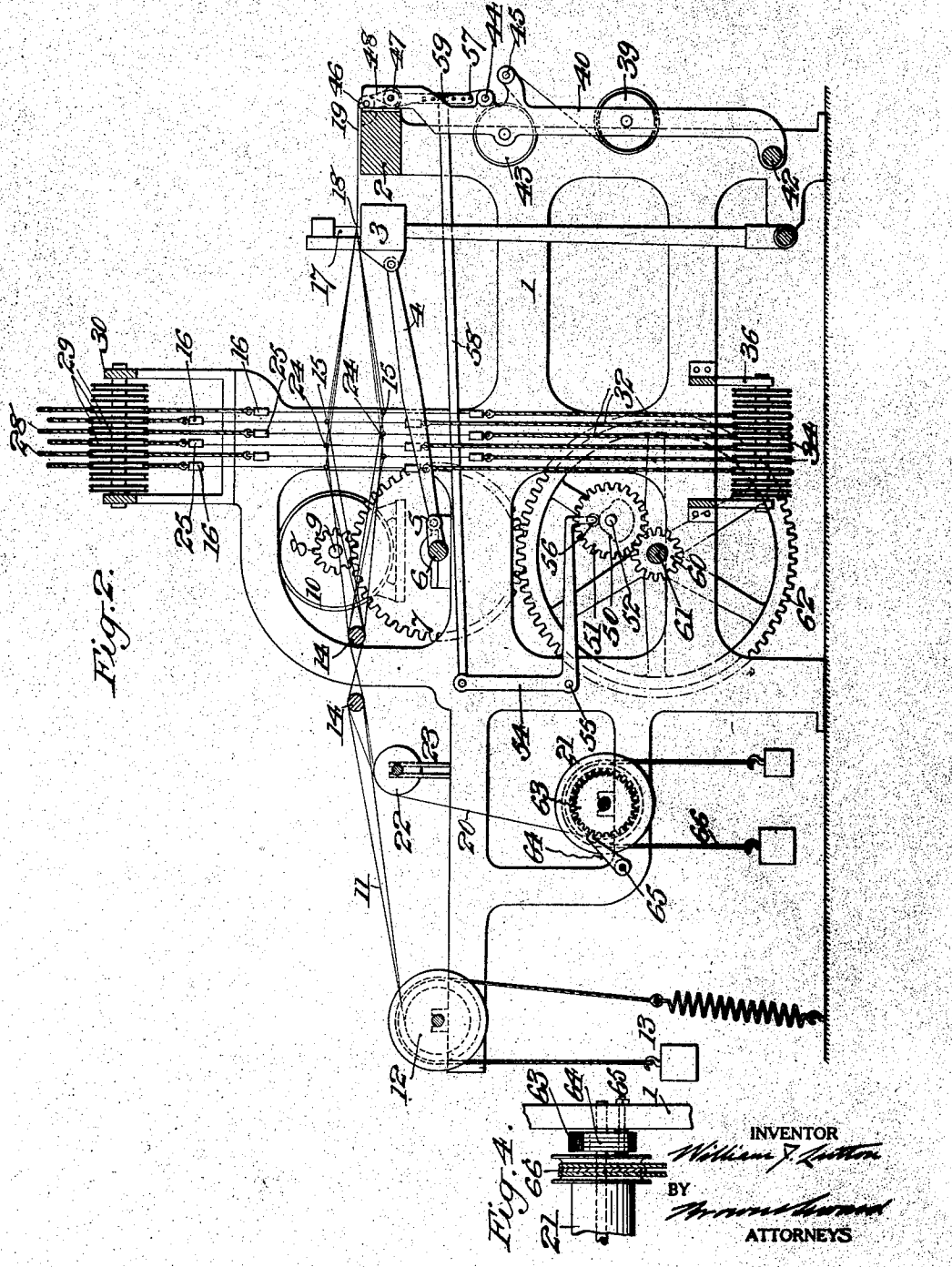


Fig. 2.

Fig. 4.

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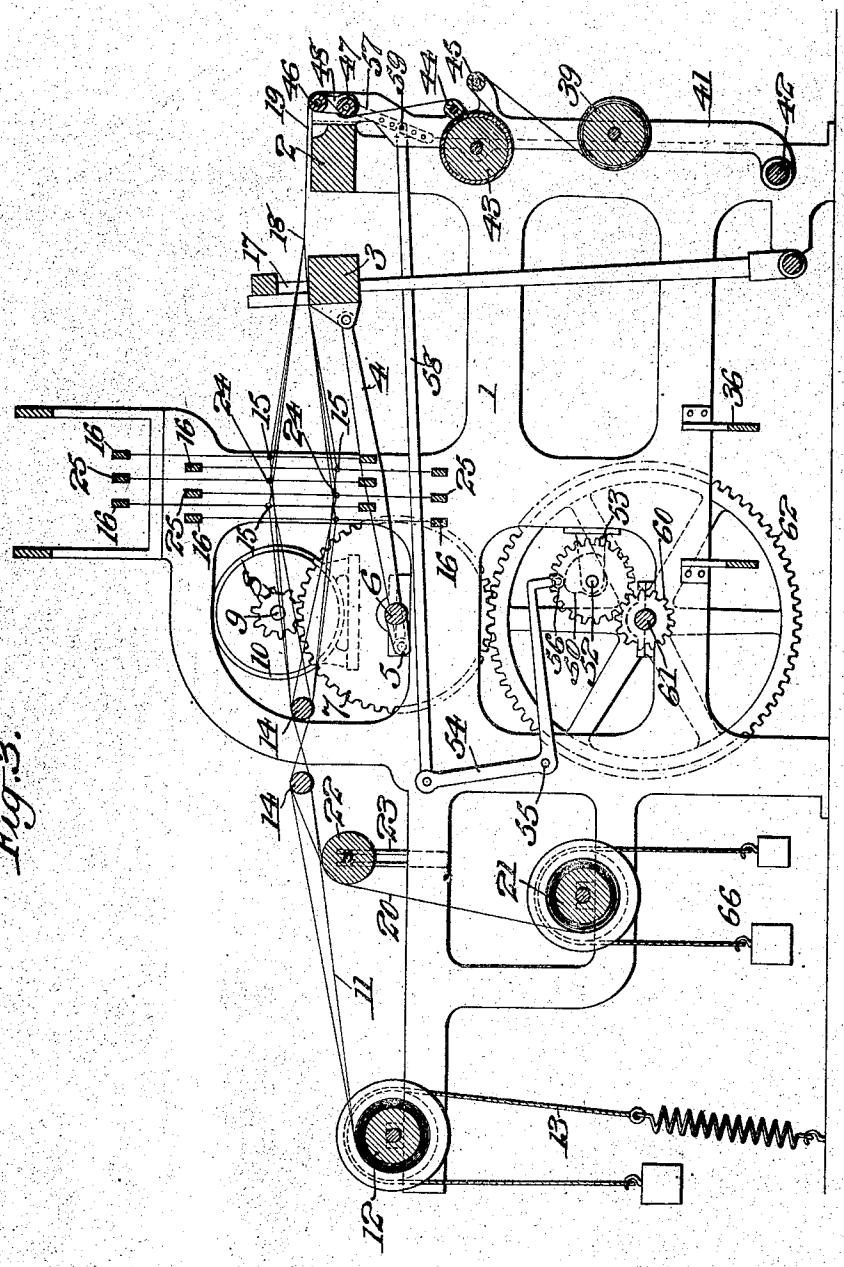


Fig. 3.

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UNITED STATES PATENT OFFICE.

WILLIAM J. LUTTON, OF PATERSON, NEW JERSEY, ASSIGNOR OF ONE-HALF TO MAURICE FRANCK, OF PATERSON, NEW JERSEY.

LOOM.

Application filed January 21, 1925. Serial No. 3,754.

This invention relates to an improvement in looms, and more particularly to looms for weaving uncut pile fabrics of silk, or other similar material.

One of the objects of my invention is to provide a mechanism for intermittently moving the fell and the woven fabric toward and away from the lay after a number of picks of ground weft threads have been woven a predetermined distance from the fell of the woven fabric.

Another object is to provide means coacting with the pile warp beam for retarding and arresting the movement of the beam in one direction thereby causing the pile warp threads to form loops as the ground weft threads are beaten up by the lay and the ground warp threads are moved rearwardly.

Another object is to provide simple and effective means for actuating said mechanism, which means is directly controlled and operated from the main driving means of the loom proper.

Another object is to provide certain improvements in the form, construction and arrangements of the several parts whereby the above named and other objects may be effectively attained.

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

Fig. 1 represents a front elevation of a loom having my improved structure applied thereto.

Fig. 2 represents a vertical section taken in the plane of the line II—II of Fig. 1, looking in the direction of the arrows.

Fig. 3 represents a similar view taken in the plane of the line III—III of Fig. 1, looking in the direction of the arrows, the parts being shown in another position, and

Fig. 4 represents a detail rear elevation of the device for arresting the rearward movement of the pile warp beam and its threads.

The main frame of the loom is denoted by 1, the breast beam by 2, the lay by 3, the pitman by 4, the crank by 5, and the drive shaft by 6. The drive shaft 6 is provided with a driving gear 7, which meshes with a pinion 8 fast on the shaft 9 of a motor 10.

The ground warp threads 11 are wound on a warp beam 12 mounted in bearings on the frame 1 in the usual manner and provided with a tension device 13 of well known or approved construction. The warp threads 11 pass from the warp beam 12 over and under separators 14, thence through guide eyes 15 in the heddles 16, and thence through the reed 17 of the lay 3 to the fell 18 of the woven fabric 19.

The pile warp threads 20 pass upwardly from the warp beam 21 over a guide roller 22 adjustably mounted in brackets 23 carried by the frame 1, thence over and under the separators 14 to and through guide eyes 24 of the heddles 25 and thence through the reed 17 to the fell 18 of the woven fabric 19. The upper end of each of the heddles is connected to an upwardly extending arm 26 of a rocking lever 27 by a flexible connection 28 which passes over guide rollers 29 journaled in a cross frame 30. The lower end of each of the heddles is connected to a lower arm 31 of the rocking levers 27 through a flexible connection 32 which is guided by rollers 33, 34. The rollers 33 are carried by a cross girt 35 secured between the frame 1, and the rollers 34 are mounted in a bracket 36 fixed to one of the frames 1. These rocking levers 27 are pivoted on a cross bar 37 carried by the frame 1.

A pattern chain 38 of the usual construction controls the movement of the rocking levers 27 by intermediate mechanism (not shown) well known to those skilled in the art.

The take up mechanism for the woven fabric is briefly illustrated and I will only describe such parts as will give a clear understanding of my invention as incorporated therein.

The winding beam 39 upon which the woven fabric is wound is mounted to rotate in vertically arranged supports 40, 41, the upper end of each of which is fixed to the breast beam 2 while the lower end is carried by a rod 42 secured between the frame 1 of the loom. A friction surfaced winding roll 43 is also mounted to rotate in the supports 40, 41 and idler rollers 44, 45 are mounted in close proximity to the roll 43, so as to cause the fabric to engage a con-

siderable portion of the periphery of the roll. Rotary motion is imparted to the winding beam 39 and roll 43 through a train of gears (not shown) in a well known or approved manner.

The fabric 19 is arranged to pass over rollers 46, 47 mounted in a rocking frame 48 pivoted at 49 between the supports 40, 41. Thus it will be seen that the fabric will pass from the breast beam 2 over rollers 46, 47 to the idler roller 44 thence around the winding roll 43 over the idler roller 45 and thence downwardly to be wound upon the winding beam 39.

The rocking frame 48 is actuated by means of a cam 50 fixed to a spur gear 51 mounted to rotate on a stud shaft 52 carried by a bracket 53 fast on the frame 1. An angle lever 54 pivoted on the frame at 55 is provided at one end with a truck roller 56 which engages the cam 50, while the other end of the lever 54 is connected to an arm 57 depending from the rocking frame 48 by a link 58. The rocking frame 48 may be adjusted in its oscillatory movement by means of the arm 57 having a series of holes for the reception of a pin 59 which secures the link 58 to the arm. Motion is imparted to the cam 50 and spur gear 51 through a pinion 60 fast on a shaft 61 mounted in bearings carried by the frame 1, and a spur gear 62 fixed on the shaft 61 arranged to mesh with the spur gear 7 of the crank shaft 6.

It is desirous that a predetermined amount of pile warp threads 20 be withdrawn from the beam 21, which amount is not returned to the beam, as in the case of the ground warp threads 11, and in order to accomplish this result the pile warp beam 21 is provided with a ratchet 63 fixed to rotate therewith and series of pawls 64 which are free to oscillate on a pin 65 fast to the frame 1, and arranged to engage the ratchet 63. The beam 21 is also provided with the usual and well known slip friction device 66, which will be readily understood by persons skilled in the art.

In operation of the loom, power from the motor 10 is applied through pinion 8, spur gear 7, and to the crank shaft 6 to actuate the lay 3, the pattern chain 38 and mechanism is actuated in unison with the movement of the lay 3 and by the usual well known mechanism; and weft shuttles (not shown) are passed between and through the warp threads in the usual manner by mechanism well known to those skilled in the art.

During the weaving of the fabric the pattern chain mechanism will control the movement of the heddles 16 so as to raise and lower the ground warp threads 11 and the pile warp threads 20 for weaving the ground or body of the fabric and for the production of the standing looped pile.

From the foregoing it will be seen that as the cam 50 is rotated it will rock the lever 54 and frame 48 through the link 58 and depending arm 57, to the position shown in Fig. 3, which movement of the roller 46 on the frame 48 in a forward direction will draw the fabric 19 with its fell 18, the ground warp and pile warp threads a predetermined distance, whereupon a number of ground weft threads are inserted into the ground and pile warp threads and beaten up to a temporary position. At this time, the cam 50 again actuates the lever 54, link 58, arm 57, frame 48, and roller 46 in the rearward direction or toward the breast beam 2, thereby allowing ground warp threads 11 to move rearwardly and be wound upon their beam 12 while the pile warp threads 20 are retarded or arrested in their rearward movement by the ratchet 63 and pawls 64 of the pile warp beam 21. At the next succeeding movement of the lay 3, the number of ground weft threads previously woven will be beaten toward the fell 18, and since there is a certain amount of slack in the pile warp threads 20 between the number of ground weft threads and the fell 18, these pile warp threads 20 will form a row of loops between the fell and ground weft threads. After this number of ground weft threads have been beaten up to the fell, the cam 50 will again actuate the frame 48 with its roller 47 through the lever 54, link 58 and arm 57, and the cycle of operation repeated.

It is obvious that various changes may be resorted to in the form, construction and arrangement of the several parts without departing from the spirit and scope of my invention; and hence, I do not intend to be limited to the particular embodiments herein shown and described except as they may be included in the claims.

What I claim is:—

1. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in one direction.

2. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device

for arresting the movement of the pile warp beam and its threads in a rearward direction.

3. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, said mechanism being actuated by a cam, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in one direction.

4. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, said mechanism being actuated by a cam, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in a rearward direction.

5. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, said mechanism comprising a rocking frame engaging the fabric and a cam for actuating said frame, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in one direction.

6. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, said mechanism comprising a rocking frame engaging the fabric and a cam for actuating said frame, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in a rearward direction.

7. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, said mechanism comprising a rocking frame having a roller engaging the fabric and a cam for actuating said frame, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in one direction.

8. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, said mechanism comprising a rocking frame having a roller engaging the fabric and a cam for actuating said frame, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in a rearward direction.

9. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, said mechanism comprising a rocking frame having a roller engaging the fabric and a depending arm, a lever linked to said arm and a cam for actuating said lever, arm and frame, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in one direction.

10. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, said mechanism comprising a rocking frame having a roller engaging the fabric and a depending arm, a lever linked to said arm and a cam for actuating said lever, arm and frame, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in a rearward direction.

11. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined inter-

vals, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in one direction, said device including a ratchet and a series of pawls.

12. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in a rearward direction, said device including a ratchet and a series of pawls.

13. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in one direction, said device including a ratchet mounted on the pile warp beam, a pin carried by the frame, and a series of pawls arranged to oscillate on said pin and engage said ratchet.

14. In a loom, the combination with the frame, the ground warp beam and its threads, the pile warp beam and its threads, the lay and means for actuating the lay, of mechanism for moving the fell of the woven fabric and the warp threads toward and away from the lay at predetermined intervals, means for rotating the ground warp beam simultaneously with the rearward movement of the warp threads, and a device for arresting the movement of the pile warp beam and its threads in a rearward direction, said device including a ratchet mounted on the pile warp beam, a pin carried by the frame, and a series of pawls arranged to oscillate on said pin and engage said ratchet.

In testimony, that I claim the foregoing as my invention, I have signed my name this 7th day of January 1925.

WILLIAM J. LUTTON.