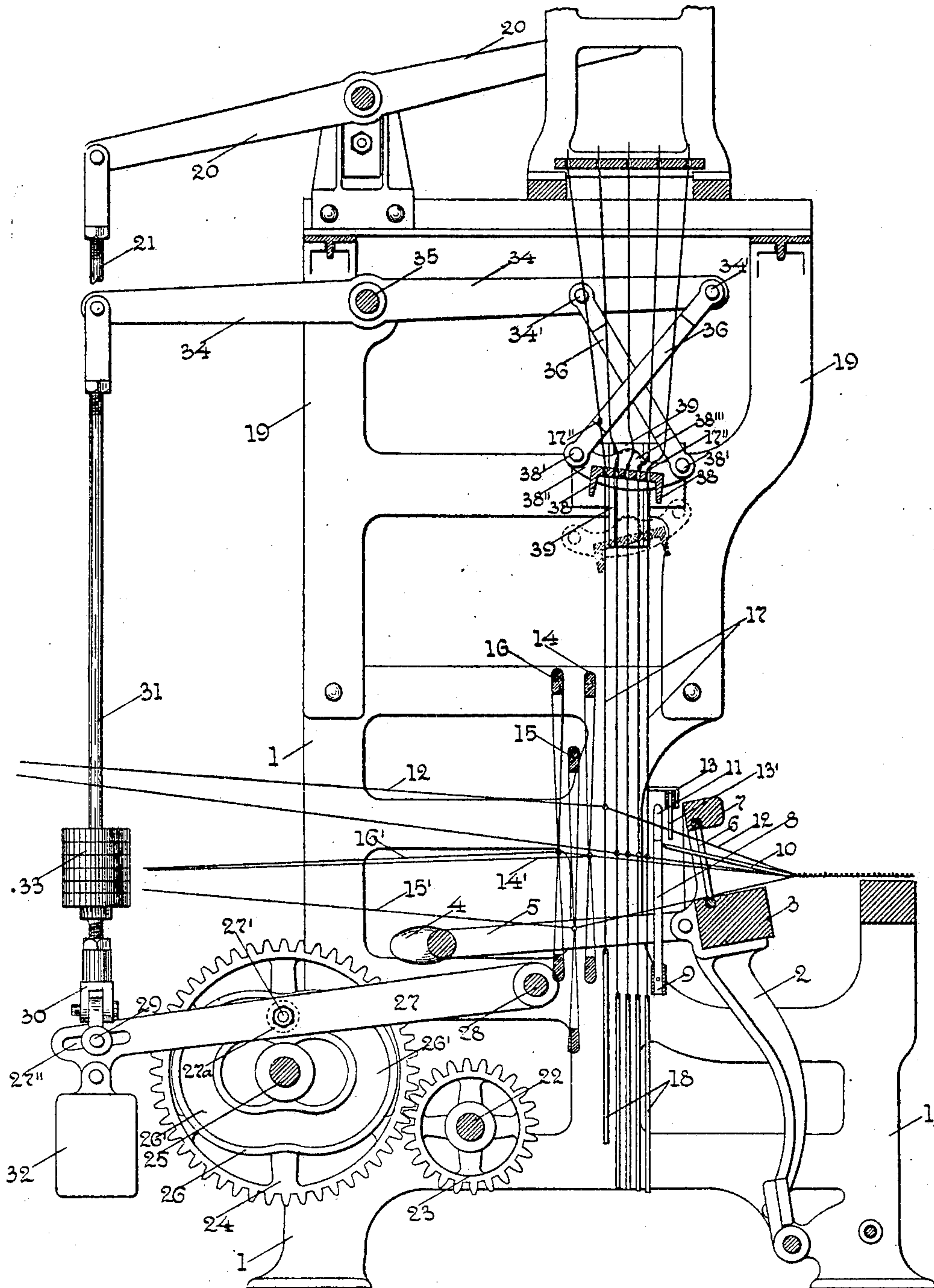


No. 799,284.

PATENTED SEPT. 12, 1905.

W. WATTIE.
LOOM COMBER BOARD MOTION.
APPLICATION FILED JAN. 23, 1905.



Witnesses
M. Bredt.
M. Laas.

Inventor
William Wattie
By John L. Dewey
Attorney.

UNITED STATES PATENT OFFICE.

WILLIAM WATTIE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO
CROMPTON & KNOWLES LOOM WORKS, A CORPORATION OF MASSACHUSETTS.

LOOM-COMBER-BOARD MOTION.

No. 799,284.

Specification of Letters Patent.

Patented Sept. 12, 1905.

Application filed January 23, 1905. Serial No. 242,284.

To all whom it may concern:

Be it known that I, WILLIAM WATTIE, a citizen of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Loom-Comber-Board Motions, of which the following is a specification.

My invention relates to a comber-board motion for pile-fabric or carpet looms, and particularly to that class of looms shown and described in United States Letters Patent No. 747,587, dated December 22, 1903, in which patented looms a jacquard mechanism is used for the pile-warps and the formation of the pile-loops is effected upon longitudinal pile-wires which extend in the direction of the length of the warp-threads and some of the pile-warps are raised and carried over the pile-wires and then lowered to form the pile-loops and all the pile-warps are raised at regular intervals above the upper ends of the blades which support the pile-wires. The weight of the pile-warp heddle-cords and weights thereon (there ordinarily being eight pile-warp heddle-cords and weights to an inch) is very great, and it has been found that it is not practical to raise all of said heddle-cords and weights to their highest position at regular intervals, as set out in said Patent No. 747,587.

The object of my invention is to improve upon the construction of the comber-board or pile-warp-raising mechanism shown and described in said patent and to provide a combined vertical moving and rocking comber-board or pile-warp-raising mechanism, as will be hereinafter fully described.

I have only shown in the drawing a detached portion of a loom-frame and parts of a loom of the class referred to with my improvements applied thereto sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawing, the figure shows a sectional elevation of a loom-frame and parts of a loom and my improvements applied thereto.

In the accompanying drawing, 1 is the loomside or frame; 2, the lay-sword, pivotally mounted at its lower end and carrying the lay 3, which is connected with the crank-shaft 4 through crank-connector 5. The

lay 3 carries the reed 6 and hand-rail 7. At the rear of the lay are a series of upright blades 8, supported in this instance at their lower ends only on a transverse bar 9. To the upper ends of the blades 8 are attached the inner ends of the pile-wires 10, the free ends of which extend forwardly between the reed 6 and form the surface over which the pile-loops are formed. Extending up between the supporting-blades 8 of the pile-wires 10 are a series of upright guide-strips 11, which separate and guide the pile-warps 12 as they are raised and lowered and moved transversely across the pile-wires 10 by the transverse reciprocating bar 13, carrying downwardly-extending teeth 13', between which the pile-warps 12 extend.

There are three harnesses 14, 15, and 16 carrying the stuffer-warp 14' and the binder-warps 15' and 16' in the ordinary way. Between the harnesses and the pile-warp-supporting blades 8 are the heddle-cords 17 for the pile-warps 12. On the lower ends of the heddle-cords 17 are weights 18. The movement of the heddle-cords 17 is controlled by the ordinary jacquard mechanism (not shown) supported on the frame 19 and operated by a lever 20 through connection 21 to cam mechanism in the ordinary way.

All of the above-mentioned parts may be of the usual and well-known construction in the class of looms referred to, and particularly in the loom shown and described in said Patent No. 747,587.

I will now describe my improvements combined with the parts above mentioned.

On the bottom shaft 22 is fast in this instance a gear 23, which meshes with and drives a gear 24, fast on a shaft 25. Also fast on the shaft 25 is a cam 26, having a cam-groove 26' in one face thereof. Into said cam-groove 26' extends a roll 27^a, (shown by broken lines,) mounted on a stud 27' on a lever 27, fulcrumed on a transverse rod 28. The outer end of the lever 27 has an elongated slot 27'' therein to adjustably receive a stud 29, to which is attached a knuckle connection 30 to the lower end of a rod or connector 31. A weight 32 is in this instance attached to the lever 27, and weights 33 are in this instance mounted on the connector 31, said weights being used to balance the weight of the heddle-cords 17 and weights 18 there-

on, as is customary. The upper end of the connector 31 is pivotally attached to the outer end of a lever 34, which is centrally pivoted on a transverse rod 35. On the opposite end of the lever 34 are two studs 34' at different distances from the fulcrum-point of said lever. The studs 34' are connected, through two crossed connectors 36, to studs 38' on the end frame 38'' of the comber-board 38. The frame 38'' has on its central outer surface a roll 38''' (shown by broken lines) for moving in a vertical guide plate or way 39, secured to the loom-frame. The comber-board 38 has a series of holes therein in the usual way, through which the heddle-cords 17 extend. Said cords are provided with knots 17'' therein, which extend above the openings in the comber-board 38 and are adapted to be engaged by the comber-board when the same is raised, as shown by full lines in the drawing, in the usual way.

It will be understood that the parts of the comber-board motion above described and shown in the drawing are duplicated on the opposite end of the loom, (not shown,) and in case of wide looms the parts of the comber-board motion may be duplicated intermediate the ends of the loom.

In the operation of the loom, through cam 26, cam-lever 27, connector 31, lever 34, and connectors 36 to the comber-board 38, said comber-board is raised and lowered, as indicated by full and broken lines in the drawing, at regular intervals. The height to which the comber-board 38 is raised is predetermined by the shape of the cam 26. The comber-board 38 is only raised to a point (indicated by full lines in the drawing) which is sufficient to bring all the pile-warps 12 in the heddle-cords 17, the knots 17'' of which cords are in engagement with the comber-board, to the middle of the shed, as shown in the drawing. The pile-warps 12 for forming the pile-loops over the pile-wires 10, which are to be moved up between the teeth 13' of the transversely-moving bar 13, (generally about one-fifth of all the pile-warps), are moved up higher by the jacquard mechanism to the position shown by the heddle-cords 17 at the left in the drawing. After the heddle-cords 17 have been raised by the comber-board, as above described, the comber-board 38 goes down to the position shown by broken lines in the drawing, allowing the heddle-cords 17 to drop and carry down the pile-warps 12 into the lower shed. The lifting mechanism connected with the pile-warps 12 in the upper shed is also operated to allow the heddle-cords connected therewith to be lowered to carry the pile-warps into the middle of the shed in the ordinary way. Through the crossed connections 36, intermediate the lever 34 and the comber-board 38, the comber-board will be rocked and moved from one angle (shown

by full lines in the drawing) to the other angle (shown by broken lines in the drawing) as it is raised and lowered. The degree of rocking and the inclination of the comber-board correspond to the inclination of the sheds in the weaving operation.

In the formation of the sheds for the passage of the shuttle the pile-warp heddle-cords at the rear have to be raised higher than the pile-warp heddle-cords at the front to obtain the desired inclination of the shed when the pile-warps are in the upper plane of the shed, and vice versa when the pile-warps are in the lower plane of the shed. By means of my combined lifting and rocking comber-board, constructed as shown in the drawing and described herein, the lifting and rocking being simultaneous, I am enabled to raise the pile-warp heddles at the rear higher than the pile-warp heddles at the front when the pile-warps are raised into the upper plane of the shed and also to raise the pile-warp heddles at the front higher than the pile-warp heddles at the rear when the pile-warps are lowered into the lower plane of the shed, as will be well understood by those skilled in the art.

The advantages of my improvements will be readily appreciated by those skilled in the art.

It will be seen that only the pile-warps which are to be moved transversely to form the pile-loops, said pile-warps forming about one-fifth part of all of the pile-warps, are raised to their highest position, according to the indications of the jacquard mechanism, while all the rest of the pile-warps are raised by the comber-board at regular intervals only to the center or middle portion of the shed, as shown in the drawing, and also by the rocking comber-board the pile-warp heddle-cords are raised and lowered on an inclined plane corresponding to the inclination of the plane of the sheds.

In my improvements much less power is required to operate the comber-board and less weights are required to counterbalance the weight of the heddle-cords and weights thereon.

It will be understood that the details of construction of my improvements may be varied from what is shown and described, if desired, and the same may be adapted to be applied to looms of different construction than the class of looms referred to.

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

1. In a loom of the class described, a jacquard mechanism for controlling the loop-forming pile-warps, in combination with a comber-board disposed between the jacquard mechanism and line of warp-threads for moving the non-loop-forming pile-warps into the middle of the shed, and means for

raising, lowering and simultaneously tilting the comber-board in two directions from the horizontal to maintain the non-loop-forming pile-warps in a common plane.

5 2. In a loom of the class described, a series of heddle-frames for controlling the stuffer and binder warps, a jacquard mechanism for controlling the loop-forming pile-warps in a shed formation, in combination with a
10 comber-board disposed between the jacquard mechanism and the line of warp-threads for moving the non-loop-forming pile-warps of a shed formation into the middle of the shed, and means for raising, lower-
15 ing and simultaneously tilting the comber-board in two directions from the horizontal to maintain the non-loop-forming pile-warps in a common plane.

3. In a loom of the class described, the
20 combination with a comber-board for controlling the non-loop-forming pile-warp threads in a shed formation, of means for raising and lowering said comber-board and simultaneously tilting the same in two direc-
25 tions from the horizontal, and means for guiding the comber-board in its rising-and-fall-

ing movement and permitting the comber-board to tilt as described.

4. In a loom of the class described, the combination with a comber-board of means 30 for raising, lowering, and rocking said comber-board in two directions from the horizontal, said means comprising a driven cam, a cam-lever, a second lever, connections between said levers, and cross-con- 35 nectors between the second lever and comber-board.

5. In a loom of the class described, the combination with a comber-board of a lever, cross-connectors between the lever and 40 comber-board, means for raising and lowering the end of the lever, a guide or way secured to the loom-frame, and a roll projecting from the comber-board into said guide or way so that as the comber-board is raised 45 and lowered, it may be permitted to rock in two directions from the horizontal.

WILLIAM WATTIE.

Witnesses:

J. C. DEWEY,
M. HAAS.