

June 23, 1925.

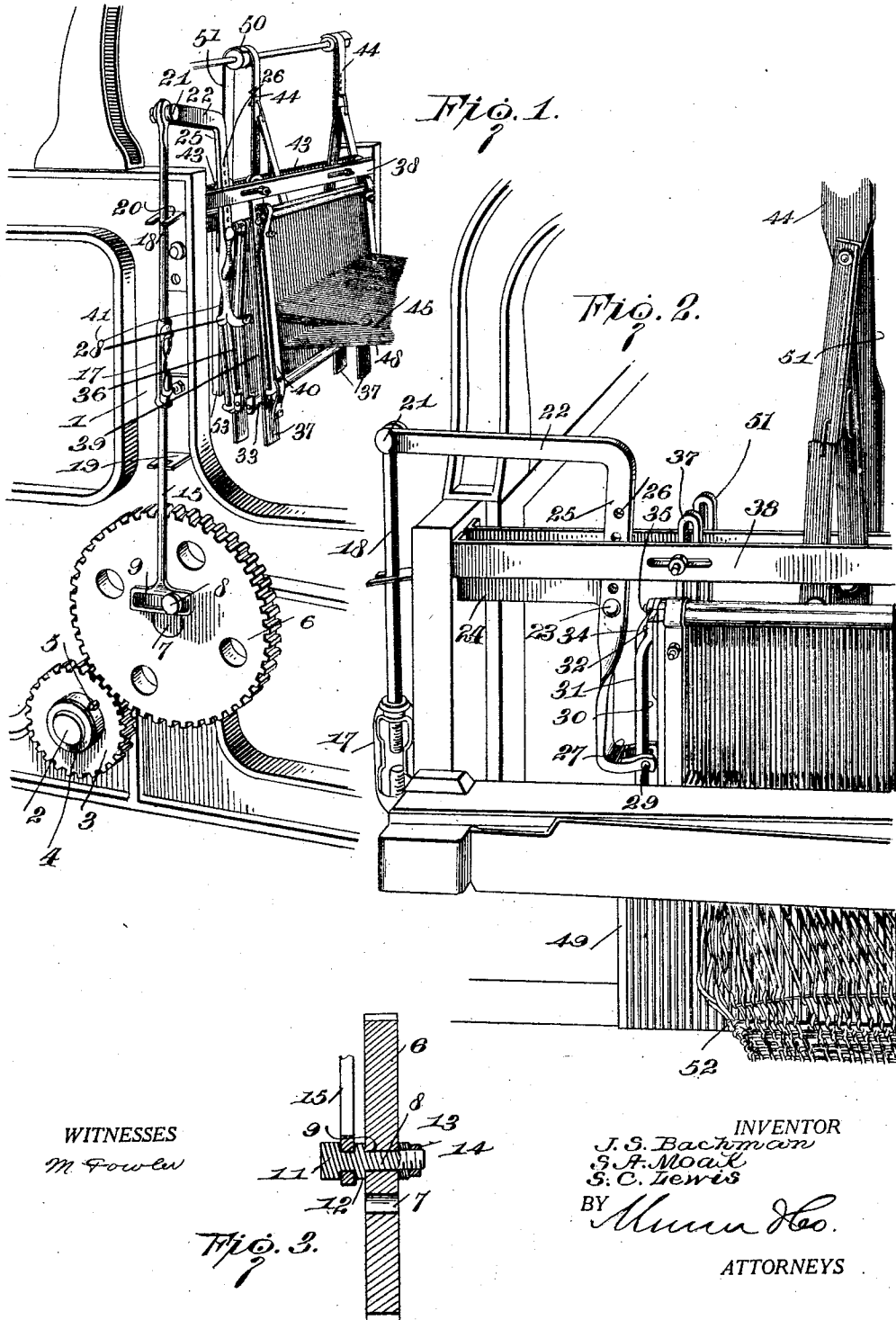
1,543,045

J. S. BACHMAN ET AL

LENO LOOM

Filed Jan. 14, 1924

2 Sheets-Sheet 1



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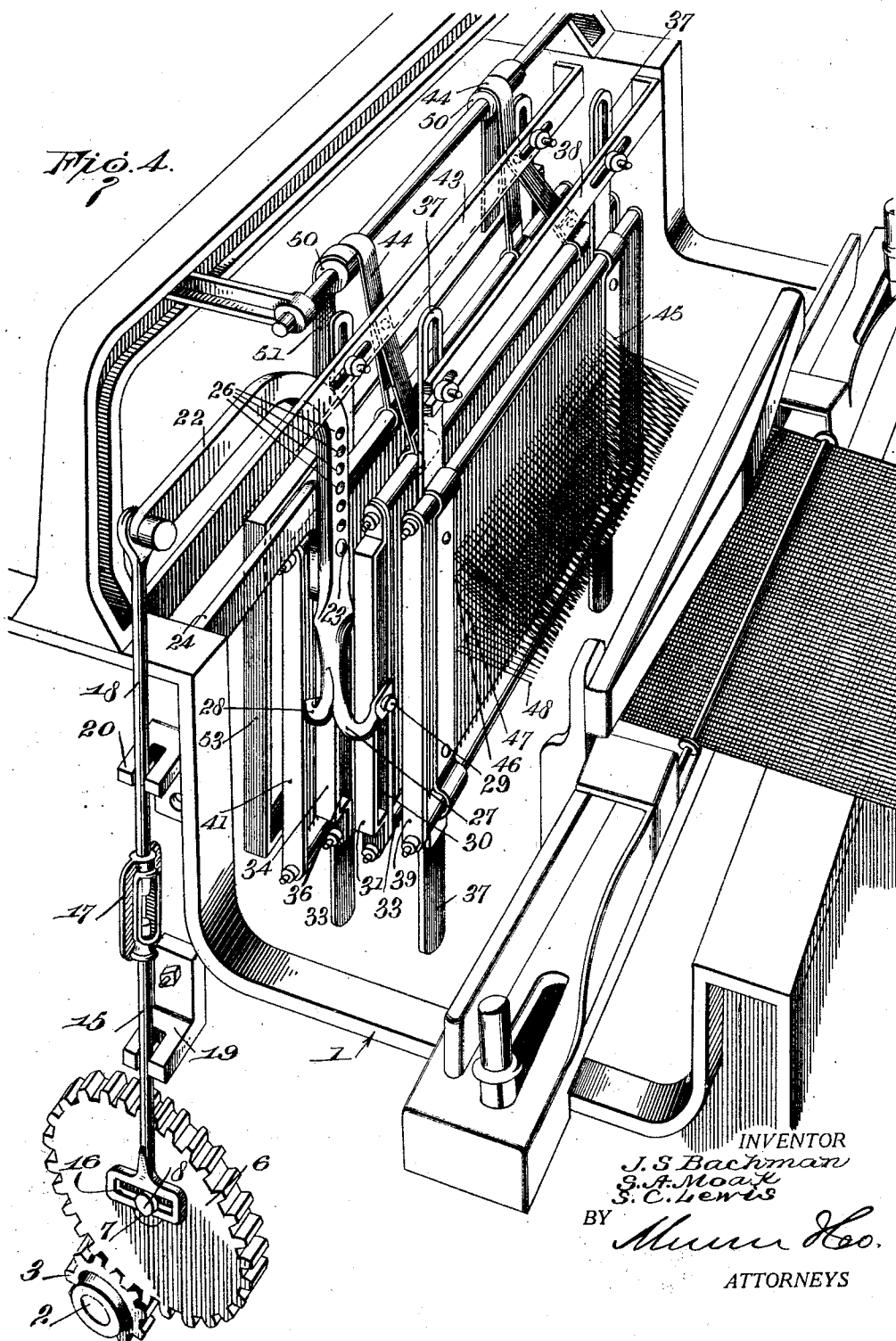
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UNITED STATES PATENT OFFICE.

JOHN SNELGROW BACHMAN, SIDNEY ARTHUR MOAK, AND STARLING CHRISTOPHER LEWIS, OF ROME, GEORGIA.

LENO LOOM.

Application filed January 14, 1924. Serial No. 686,068.

To all whom it may concern:

Be it known that we, JOHN SNELGROW BACHMAN, SIDNEY ARTHUR MOAK, and STARLING CHRISTOPHER LEWIS, citizens of the United States, and residents of Rome, in the county of Floyd and State of Georgia, have invented certain new and useful Improvements in Leno Looms, of which the following is a specification.

This invention relates to leno looms for weaving leno-tubing and has for its object the provision of a device adapted to be incorporated in a leno loom for laterally shifting certain of the healds whereby certain of the warp threads are twisted with other warp threads for locking the picks in position, the locking of the picks in the so-called knit fabric being essential in view of the loose weave.

A further object of the invention is the provision of a device adapted to be attached to a plain or common two-harness loom for laterally shifting certain of the healds while permitting a vertical oscillation of the same whereby leno-tubing is formed; the remaining healds being maintained stationary to support a shed of warp threads in stationary position.

This invention will be best understood from a consideration of the following detailed description, in view of the accompanying drawing forming a part of the specification; nevertheless it is to be understood that the invention is not confined to the disclosure, being susceptible of such changes and modifications which shall define no material departure from the salient features of the invention as expressed in the appended claims.

In the drawings:

Figure 1 is a view in perspective of a two-harness loom showing our invention applied for laterally shifting a pair of the healds.

Figure 2 is a view in perspective looking towards the rear of the machine disclosing oscillating mechanism for certain of the healds.

Figure 3 is a section through the vertical diameter of the operating gear for the shifting mechanism.

Figure 4 is a view in perspective of a leno loom showing our attachment applied in operative position with the same.

Referring more particularly to the draw-

ings, 1 designates a frame of a loom having a cam shaft 2 mounted in bearings on the frame and driven in any approved manner. The outer projecting end of the shaft is provided with a spur gear 3 having a collar 4 integrally formed therewith. A set screw 5 locks the collar and likewise the gear to the shaft 2.

In mesh with the gear 3 is a spur gear 6, the ratio of the gear 6 to the gear 3 being 2:1. Gear 6 is mounted on a stud shaft 7 connected to the frame 1 and is provided with a stud 8 disposed eccentrically with respect to the shaft 7. The stud 8 is adjustable in a slot 9 in the gear 6 and is provided with a head 11 and an annular shoulder 12 spaced from the head with the shoulder in engagement with the face of the gear 6. The outer end of the stud is threaded and engaged by a nut 13 for securing the stud in a predetermined position within the slot 9 and a nut 14 locks the nut 13 against displacement.

A vertically disposed oscillating rod 15 has its lower end enlarged and slotted as shown at 16 to receive the crank pin or stud 8 with the enlarged portion received between the head and the shoulder 12 of said stud. The upper end of the rod 15 is connected by means of a turn-buckle 17 to an aligned reciprocating rod 18.

The rod 15 is maintained in position when reciprocating by means of a slotted bracket 19 secured to one side wall of the frame while rod 18 is similarly maintained in position by means of a slotted bracket 20 likewise secured to the side wall of the frame 1 and in alinement with the bracket 19. The upper end of the rod 18 is pivotally connected at 21 to a rock lever 22 which is pivoted at 23 to a bracket arm 24, said bracket arm being secured to the inner wall of the side frame of the supporting structure of the loom. The lower end 25 of the rock lever 22 is provided with a plurality of perforations 26 adapted to receive the pivot pin 23 for adjusting the throw of the lever 22.

The turn-buckle 17 has a right hand and a left hand thread for adjusting the length of the rods 15 and 18 and thereby likewise effecting the throw of the lever 22. The lower end of the arm 25 of said operating lever is provided with a fork comprising prongs 27 and 28. The outer free ends of

said prongs are perforated to receive a pin 29. This pin rides in a slot 30 in a bar 31 which is rigidly secured at 32 to a vertically oscillating heald 33. The pin 29 passes through a second slotted bar 34 which is rigidly secured at 35 to a second vertically oscillating heald 36.

Slotted bars 37 are rigidly secured to a transverse bar 39 which is connected to the side members of the frame 1 and located above a stationary heald 39. The stationary heald 39 is secured to the bars 37 and is adapted to be adjusted manually and vertically through the slotted bars 37. A fourth heald 41 is secured to bars similar to the slotted bars 37 which are adjustably connected to a second transverse bar 43. The second transverse bar is likewise rigidly secured to the side members of the frame 1.

The intermediate healds 33 and 36 are bolted together and connected by means of straps 44 to the boss rollers 50. The skeleton harness frame 53 is also connected by means of straps 51 to the boss rollers 50. Intermediate harness and skeleton harness are vertically reciprocated by means of regular two-harness cams operated by the cam shaft 2.

The shed of warp threads comprise two sets of stationary sheds and two sets of movable sheds, the movable sheds being carried by the oscillating healds 33 and 36. Shed 45 is carried by the stationary heald 39 while shed 46 is controlled by heald 33; shed 47 is controlled by oscillating heald 36 while shed 48 is controlled by the stationary heald 41. A reed or beater 49 receives the warp threads of the four sheds and is adapted to beat the picks 52 in position in the usual manner. The usual form of shuttle is employed for carrying the picks back and forth.

The operation of our device is as follows:

The adjustment of the lever 22 by means of the pin 23 and the perforation 26 and likewise the adjustment of the throw of the lever by means of the turn-buckle 17 is dependent upon the size and the kind of loom employed and likewise upon the kind or design of materials it is intended to manufacture. The healds 33 and 36 are bolted together and vertically reciprocated with the skeleton harness in the usual manner while the healds 39 and 41 remain stationary and therefore the shed 46 controlled by heald 33 is moved up and down in the usual manner for crossing the warp threads of said shed with the warp threads of shed 45 in a vertical plane to lock the picks 52 in position while movable shed 47 cooperates with the stationary shed 48 for crossing the warp threads vertically and locking the picks in position. It will be seen that by the usual operation of the healds and the

movement of the sheds that a tubing is formed with the sheds 45 and 46 cooperating to form the upper portion of the tube while sheds 47 and 48 cooperate to form the lower portion of the tubing.

In order to lock the picks 52 in a predetermined position, we shift the healds 33 and 36 laterally of the machine, thereby horizontally crossing the warp threads of shed 46 with warp threads of shed 45, while the warp threads of shed 47 are crossed horizontally with the warp threads of shed 48.

The gear 3 meshing with gear 6 drives the last mentioned gear and through the crank pin 8 causes vertical reciprocation of the aligned and connected rods 15 and 18 thereby oscillating the rock lever 22. The fork at the lower end of the arm 25 of said lever oscillates laterally and in a horizontal manner and therefore shifts the healds 33 and 36 in a horizontal manner for crossing the warp threads of the various sheds as has been previously explained.

The slotted connecting members 31 and 34 of the respective healds 33 and 36 permit the connecting members to rise vertically on the pin 29 while oscillation of the lever 22 causes a lateral shifting of the healds 33 and 36. The oscillating lever 22 shifts the healds 33 and 36 and therefore the warp threads carried by said healds in the working harness from first one side to the other of the threads in the stationary harness thereby crossing the warp threads between each pick of the filling. The loom in this case delivers two picks to one stroke of the oscillator 22, one pick crossing the ends of the front working harness with the ends of the front stationary harness thereby weaving the upper side of the tube. The next pick crosses the ends of the back working harness or heald 41 thereby weaving the lower side of the tubing. The next stroke of the oscillator in the opposite direction gives the same results but in the opposite direction so that the warp threads of the shifting healds cross an adjacent warp thread of the stationary healds and then upon the return stroke of the shiftable warp threads are transposed diagonally across the other adjacent warp thread. It will be seen that the loom delivers four picks to one complete movement of the oscillator.

Heald 39 is located at a sufficient elevation to form the top shed of tube and heald 41 is located below heald 39 to properly form the lower side of the tube.

In order that the threads of sheds 46 and 47 may be crossed horizontally over the threads of the respective sheds 45 and 48, healds 33 and 39 cooperating to form the top of the leno tube are each provided with an extra space between each needle eye. The threads from healds 36 and 41 are drawn

through the space which prevents them from coming into contact with needle eyes of healds 33 and 39.

5 Healds 36 and 41 cooperate in making bottom of tube and each of these are provided with an extra space between each needle eye and the threads from healds 33 and 39 are drawn through said spaces.

10 The needle eyes of healds 39 and 36 point upward while the needle eyes of 33 and 41 point downward. These eyes are not shown on the drawings since such a construction is well known in the art.

What we claim is:

15 In a leno loom, the combination with vertical reciprocating healds and stationary healds, means for causing shifting of the reciprocating healds, said means comprising a

rod having an enlargement at its lower end, said enlargement being provided with a horizontal slot, a drive gear, a pin on the gear received by the slot, a lever having an adjustable pivotal mounting intermediate its ends, one end of the lever being connected with the rod, a yoke at the opposite end of the lever having arms projecting laterally and then inwardly and with an arm connected with a heald for causing simultaneous lateral shifting of the reciprocating healds and means for maintaining the stationary healds in position while the reciprocating healds are shifted laterally between said stationary healds.

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