

No. 679,895.

Patented Aug. 6, 1901.

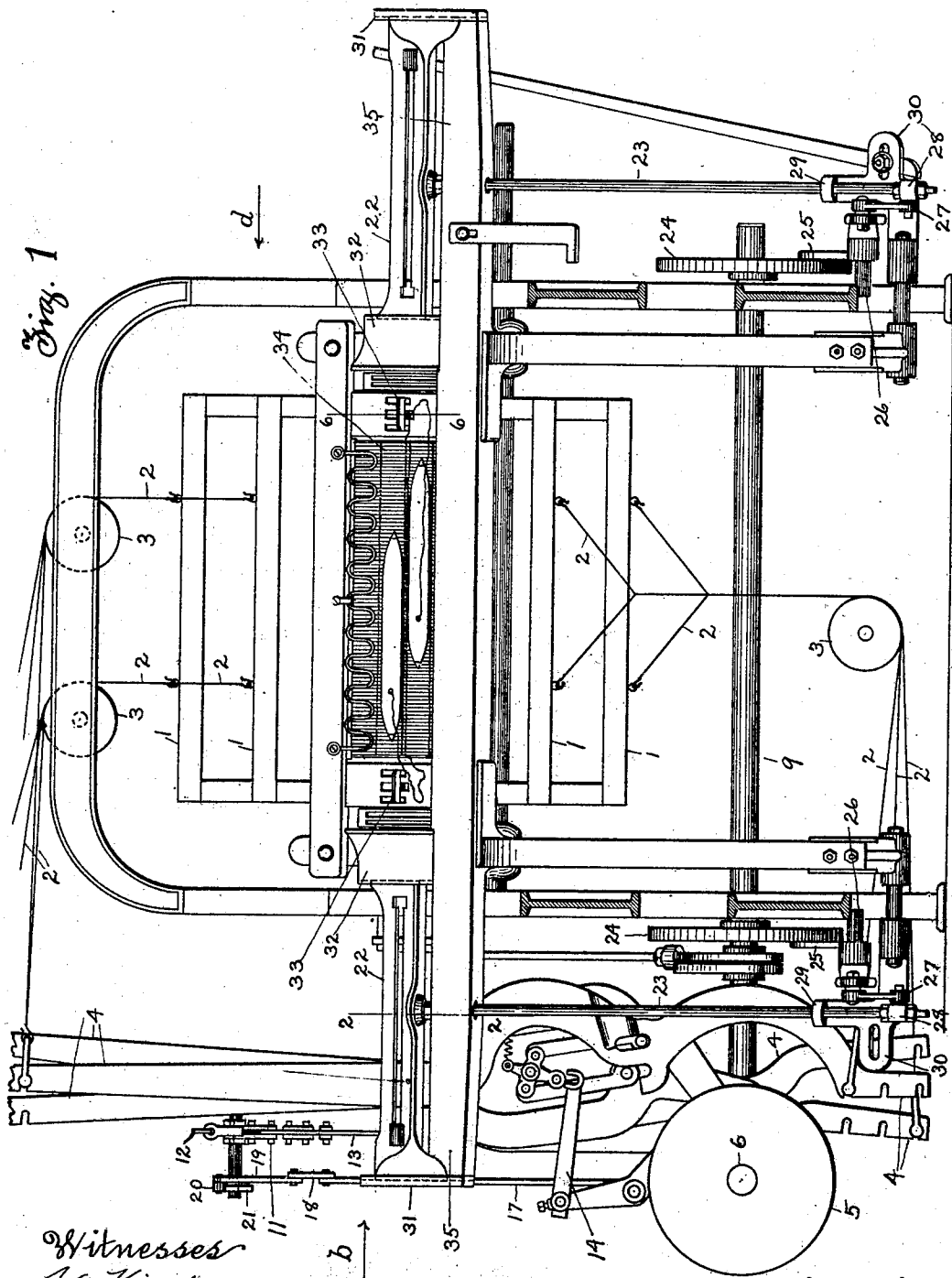
G. F. HUTCHINS.

BAG LOOM.

(Application filed Mar. 9, 1901.)

(No Model.)

4 Sheets—Sheet 1.



Witnesses
J. A. Kinley
M. Haas.

Inventor
George F. Hutchins

By John C. Dewey.

Atty

No. 679,895.

Patented Aug. 6, 1901.

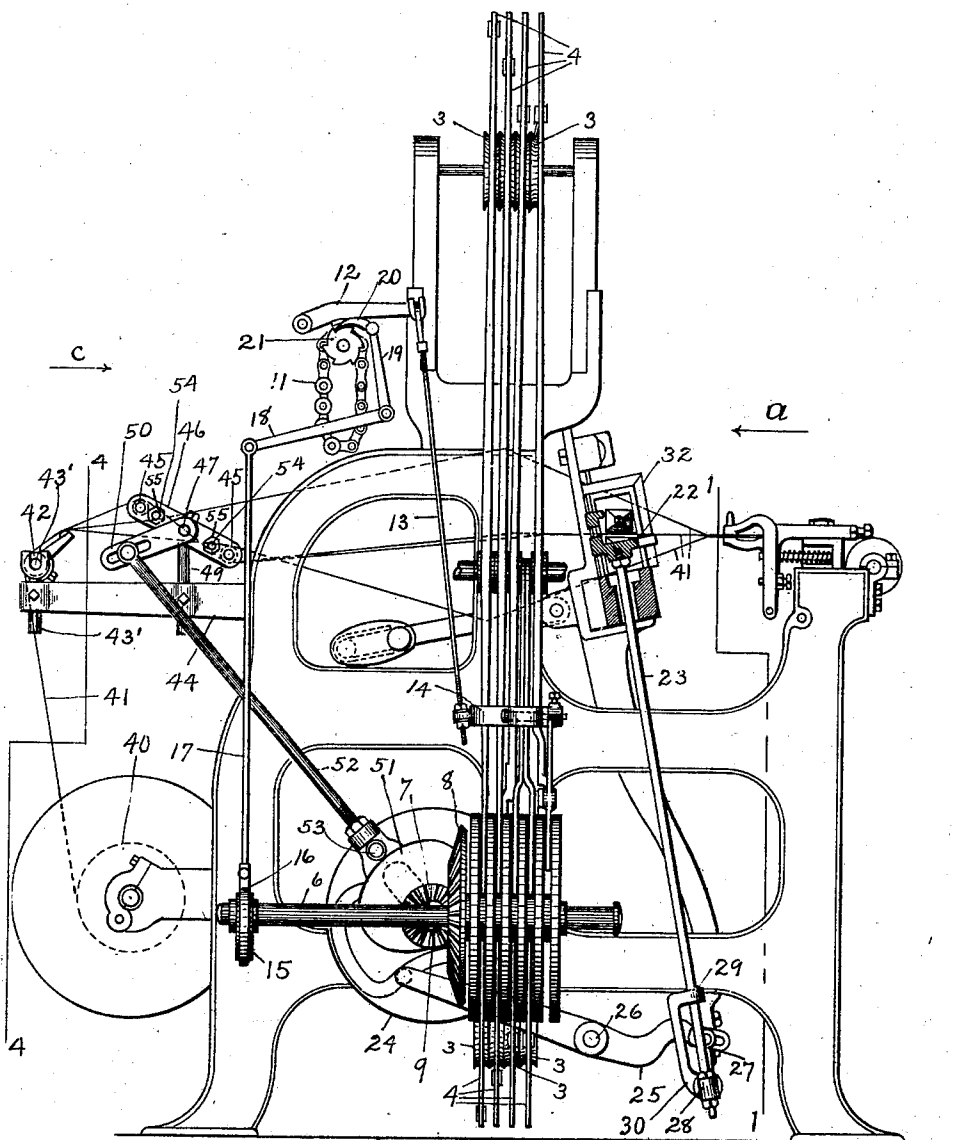
G. F. HUTCHINS.
BAG LOOM.

(Application filed Mar. 9, 1901.)

(No Model.)

4 Sheets—Sheet 2.

Fig. 2



Witnesses
S. A. Kinsley
M. Haas.

Inventor
George F. Hutchins

By *John C. Dewey* Atty

No. 679,895.

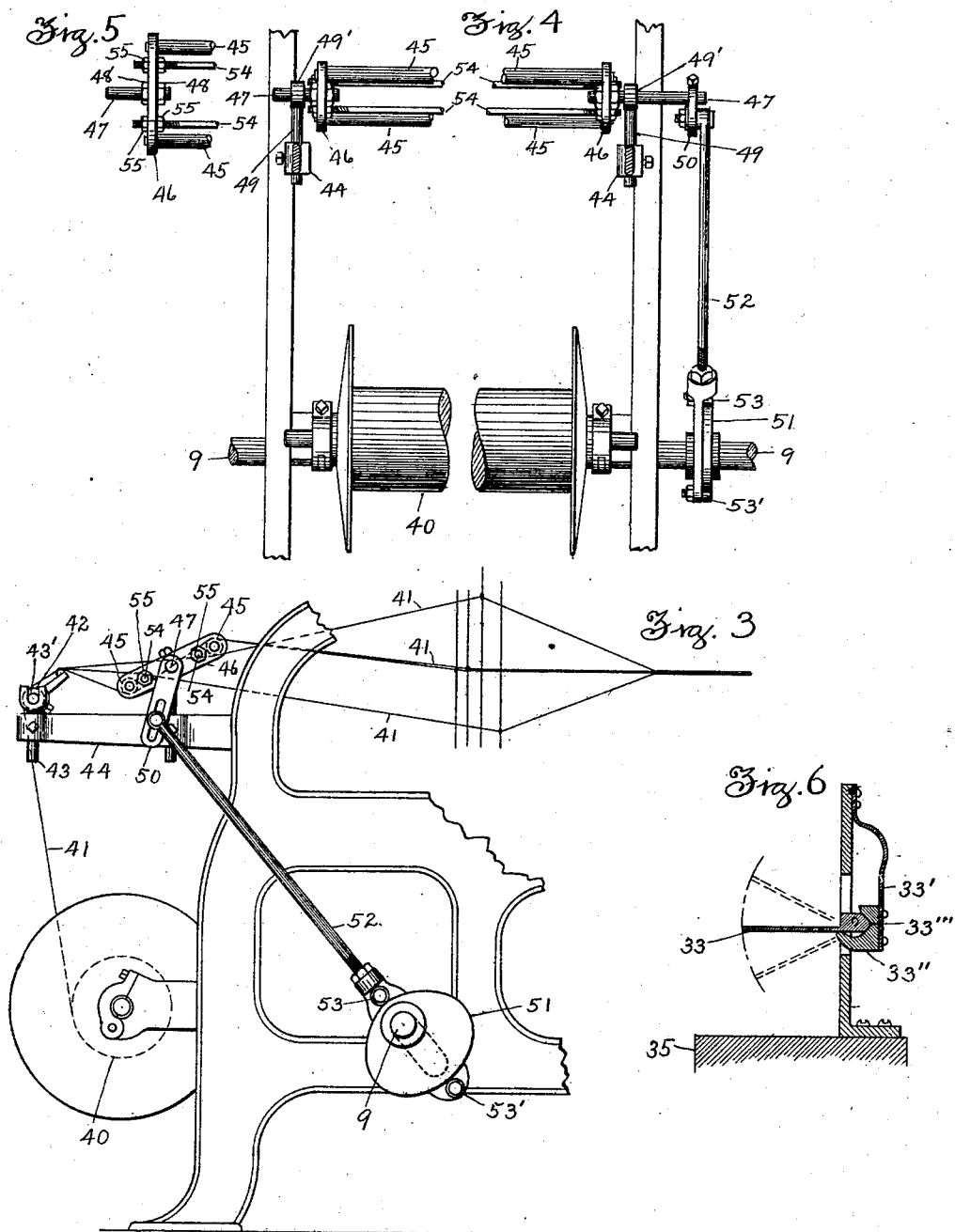
Patented Aug. 6, 1901.

G. F. HUTCHINS.
BAG LOOM.

(Application filed Mar. 9, 1901.)

(No Model.)

4 Sheets—Sheet 3.



Witnesses
A. A. Kinley
M. Haas.

Inventor
George F. Hutchins.

By John C. Dewey Atty

No. 679,895.

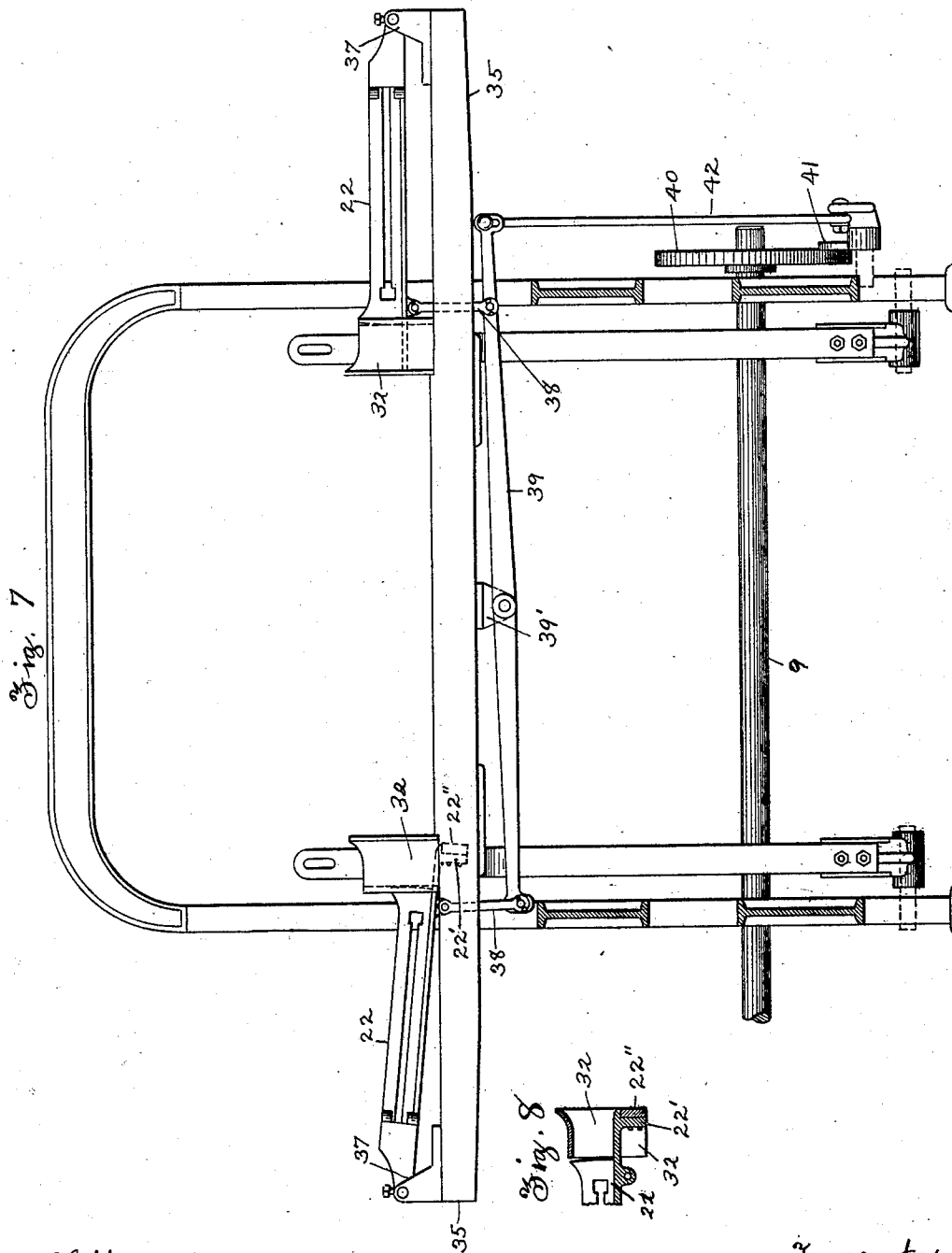
Patented Aug. 6, 1901.

G. F. HUTCHINS.
BAG LOOM.

(Application filed Mar. 9, 1901.)

(No Model.)

4 Sheets—Sheet 4.



Witnesses
J. A. Lindsey
W. H. Hadd.

Inventor
George F. Hutchins.

By John C. Dewey.

Att'y

UNITED STATES PATENT OFFICE.

GEORGE F. HUTCHINS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO
CROMPTON & KNOWLES LOOM WORKS, OF SAME PLACE.

BAG-LOOM.

SPECIFICATION forming part of Letters Patent No. 679,895, dated August 6, 1901.

Application filed March 9, 1901. Serial No. 50,446. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. HUTCHINS, 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 Bag-Looms, of which the following is a specification.

My invention relates to looms for weaving bags or other tubular fabrics, and particularly to that class of looms in which two shuttles are simultaneously thrown from opposite sides of the loom, one leaving its thread in the upper and the other in the lower of two sheds formed in the warp. In this class of looms as heretofore constructed an upper raceway has been provided for the upper shuttle, upon which said shuttle is supported and travels.

The object of my invention is to improve upon the construction of looms for weaving bags or other tubular fabrics as heretofore constructed and above referred to and to provide a loom for weaving bags or other tubular fabrics in which the upper shuttle is supported and travels on the central or intermediate warp-threads—that is, the warp-threads forming the lower part of the upper shed and the upper part of the lower shed—without any raceway or other support.

In carrying out my invention I combine with the other parts of a loom for weaving bags or other tubular fabrics a warp-tension mechanism, such as is shown by my prior patent, No. 667,527, dated February 6, 1901, which will put a uniform tension on all of the warp-threads without regard to whether they extend in the plane of the fabric or above or below the plane of the fabric. In this way the central warp-threads forming the lower part of the upper shed and the upper part of the lower shed are under the same tension as the warp-threads forming the upper part of the upper shed and the lower part of the lower shed and this tension on the central warp-threads is sufficient to cause them to support and act as a raceway for the upper shuttle as it passes through the upper shed, all as will be hereinafter fully described.

In addition to the warp-tension mechanism above referred to I provide a guide-plate, preferably movable and spring-actuated, at each end of the reed to guide or direct the shuttles into the shuttle-boxes or into the sheds in the warp-threads. I also provide in case of swinging or hinged shuttle-boxes an extension or lip on one of the shuttle-boxes to be engaged by the shuttle and check its motion, provided the box is not in proper position to receive the shuttle.

My invention consists in certain novel features of construction of my improvements above referred to, as will be hereinafter fully described.

I have only shown in the drawings such parts of a loom of the class referred to as are necessary to enable those skilled in the art to which my improvements belong to understand the construction and operation of the same.

Referring to the drawings, Figure 1 is a sectional front view of a loom embodying my improvements, taken at a point indicated by line 1 1, Fig. 2, looking in the direction of arrow *a*, same figure. Fig. 2 is a side or end view of the loom shown in Fig. 1 looking in the direction of arrow *b*, same figure. The end of the lay and shuttle-box are shown in section, taken at a point indicated by line 2 2, Fig. 1. Fig. 3 shows the opposite position of the tension mechanism and its operating means shown in Fig. 2. Fig. 4 is a rear view of parts shown in Fig. 2, taken at a point indicated by lines 4 4, same figure, looking in the direction of arrow *c*. Fig. 5 is a plan view of one end of the tension-rolls detached. Fig. 6 is, on an enlarged scale, a sectional view of the shuttle guide-plate, taken at a point indicated by line 6 6, Fig. 1. Fig. 7 is a front view of a portion of the loom, showing a modified construction of the movable shuttle-boxes; and Fig. 8 is a sectional detail of the end of the shuttle-box and the shuttle-guide shown at the left in Fig. 7.

As my present invention relates only to my improvements in looms for weaving bags or other tubular fabrics above referred to, it

will not be necessary to particularly describe the construction and operation of the other parts of the loom shown in the drawings and which may be of any usual and well-known construction and operation.

In the accompanying drawings the shedding-motion for forming the sheds in the warp-threads during the weaving operation consists of the usual harnesses 1—in this instance four in number—connected by cords 2, passing over sheaves 3 to the upper and lower ends of the jacks 4, which are operated by cams 5, fast on a shaft 6, driven through gears 7 and 8 from the bottom shaft 9. The movement of the jacks 4 is in this instance controlled by the indicating mechanism shown, consisting of a pattern-chain 11, which acts on an indicating-lever 12, connected through rod 13 and pivoted arm 14 with mechanism 20 to regulate the movement of the jacks through their operating-cams, which it is not necessary to describe, as it forms no part of my present invention. The pattern-chain 11 of the indicating mechanism is in this instance operated from the cross-shaft 6 through cam 15, fast on the shaft 6, strap 16, connector 17, levers 18 and 19, pawl 20, and ratchet 21. Any other form of pattern or indicating mechanism for regulating the movement of the jacks to form the proper sheds in the operation of the loom may be used, if preferred.

The box-motion of the loom shown may be of any well-known construction and operation in the class of looms to which my improvements relate and in which there is a movable shuttle-box at each end of the lay, one box being moved down to receive the shuttle passing through the lower shed and then up to discharge the same shuttle through the upper shed and the other box being simultaneously moved up to receive the shuttle through the upper shed and then down to discharge the shuttle through the lower shed, as is customary.

In Fig. 1 each shuttle-box 22 is supported at its central part on and attached to a vertical moving rod 23 to have an up-and-down motion with said rod. Each rod 23 is operated to move the shuttle-box 22, attached thereto, in this instance by cams 24 on the bottom shaft 9, through levers 25, pivoted at 26, link 27, and collar 28, fast on the lower end of the rod 23, which passes through a guide 29 on the lay shoe or casting 30. Each shuttle-box 22 is guided by a plate 31 at the end of the lay and the mouthpiece 32, secured on the lay.

In connection with the movable shuttle-boxes I use two movable guide-plates 33, one at each end of the reed 34, pivotally supported on the lay 35 and extending in the same horizontal plane as the plane of the central warp-threads, as shown in Fig. 1, and above the raceway. The guide-plates 33 are preferably hinged or pivotally attached to the lay to move up and down, as indicated by broken lines in Fig. 6, when engaged by the shuttles

and are spring-actuated or caused to return to and are held in their normal position, in this instance by a spring device, consisting of a flat spring 33', carrying at its free end a recessed block 33'' to engage a pointed or wedge-shaped projection 33''' on the guide-plate 33, as shown in Fig. 6. The movable guide-plates 33 at each end of the reed act to properly guide and direct the shuttles as they pass out of the shuttle-boxes into the sheds or out of the sheds into the shuttle-boxes.

In Fig. 7 I have shown a modified construction of the shuttle-boxes. Each shuttle-box 22 is hinged or pivoted at its outer end to a stand 37 on the lay 35 and is connected at its front end, through a link 38, with the central pivoted lever 39. The lever 39 is operated to have a rocking motion on its pivotal support 39' by a cam 40 on the bottom shaft 9 through lever 41 and connector 42. The hinge shuttle-boxes 22, through the movement of the lever 39, are simultaneously raised and lowered—that is, one box is lowered while the other is raised, and vice versa.

The shuttle-box 22 at the left end of the loom (shown in Fig. 7) should be in the inclined position shown when the shuttle is received into said box, with the inner projecting end thereof on a level with the raceway, as shown in Fig. 7; but if said box should not be in this position to receive the shuttle thrown from the other side of the loom the end of the shuttle would extend under the projecting end of the shuttle-box and prevent the lowering of the shuttle-box. In order to prevent this, I provide a downwardly-extending lip 22' on the outer end of the shuttle-box, which may have a cushion-surface on the outer space thereof, as shown at 22'', (see Fig. 8,) so that if the shuttle-box is not in its proper lowered position to receive the shuttle the end of the shuttle will strike against the cushion-surface 22'' and be checked, and the shuttle-box can be moved to its lowered position, the lip 22' entering a recess in the upper side of the lay, as shown by broken lines, Fig. 7.

I will now describe my improvements in warp-tension mechanism above referred to and intended to be combined with the other parts of the loom to apply a uniform tension on all of the warp-threads, and particularly to put such a tension on the central warp-threads that the upper shuttle will travel on said warp-threads as a raceway without the necessity of any other support or raceway ordinarily used in this class of looms.

From the warp-beam 40 the warp-threads pass over the spring back roll 42, mounted in bearings 43' on the upper ends of the studs 43, secured in the outer ends of the arms 44, secured to the loom-frame to my tension mechanism. My tension mechanism consists in this instance of two rods or rolls 45, each mounted at its ends in a centrally-pivoted rocking lever or arm 46. Each lever 46 has in this instance secured thereto a stud 47, which has one end

threaded and screwed into a threaded hole in the lever 46 and secured therein by nuts 48, one upon each side of the lever 46. Each stud 47 is mounted to turn in a bearing 49' at the upper end of a stud 49, secured in the arms 44. (See Fig. 4.) Secured upon one of the studs 47 is a crank-arm 50, which is operated to communicate a uniform rocking motion to the lever 46 and the rolls 45 at regular intervals by a cam 51 on the shaft 9 through a connector 52, having a slot through which the shaft 9 extends and carrying rolls 53 and 53', which engage the periphery of the cam 51. The warp-threads 41 after passing over the back roll 42 are divided into four sets, one set for each harness. The two sets of warp-threads which form the central part of the two sheds shown in Fig. 2 pass over the outer roll 45 and under the inner roll 45, and the other two sets of warp-threads, which form the upper part of the upper shed and the lower part of the lower shed, (shown in Fig. 2,) pass between the two rolls 45. It will be seen that in the position of the two rolls 45 shown in Fig. 2 tension will be applied to the central warp-threads to take up any slack therein and hold them taut to form a support or raceway for the upper shuttle to travel on. In the opposite position of the arms 46 and rolls 45 (shown in Fig. 3) the central warp-threads shown in Fig. 2 will form the upper and lower warp-threads of the two sheds and the upper and lower warp-threads shown in Fig. 2 will form the central warp-threads, said threads passing under one roll and over the other, as shown in Fig. 3, so that any slack in said central warp-threads will be taken up and they will be held taut to form a support or raceway for the upper shuttle. During the intermediate positions of the rolls 45 the harnesses are changing their positions on the backward stroke of the lay after the shuttles have passed through the sheds.

A positive rocking motion is communicated to the levers 46 and rolls 45 at regular intervals through the mechanism shown in the drawings or through any other suitable mechanism to move said levers and rolls from the position shown in Fig. 2 to the position shown in Fig. 3, and vice versa.

In order to strengthen the tension mechanism and to tie the levers 46 together to hold the rolls 45 in proper position, I may use two rods 54, extending between the rolls 45 and secured at their ends in holes in the levers 46 by nuts 55, as shown in Fig. 5.

It will be understood that the details of construction of my improvements may be varied, if desired.

I have shown my improvements in warp-tension mechanism above referred to as combined with other parts of a loom for weaving tubular fabrics; but I do not wish to limit my improvements in warp-tension mechanism to this particular class of looms, as they may be used on other looms.

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, for weaving tubular fabrics, the combination with the lay, of a yielding shuttle guide-plate on the lay, at each end of the reed, extending in the same horizontal plane as the central warp-threads, substantially as shown and described.

2. In a loom of the class described, for weaving tubular fabrics, the combination with the lay, of a movable shuttle guide-plate on the lay, at each end of the reed, extending in the same horizontal plane as the central warp-threads, substantially as shown and described.

3. In a loom of the class described, for weaving tubular fabrics, the combination with the lay, of a spring-actuated shuttle guide-plate on the lay, at each end of the reed, extending in the same horizontal plane as the central warp-threads, substantially as shown and described.

4. In a loom of the class described, for weaving tubular fabrics, the combination with the lay, of a hinged shuttle-box at each end of the lay, one of said shuttle-boxes having a downwardly-extending lip at its outer end, for the purpose stated, substantially as shown and described.

5. In a loom of the class described, for weaving tubular fabrics, the combination with the lay having a movable shuttle-box at each end, and means for moving said boxes alternately up and down, and a shuttle guide-plate at each end of the reed extending in the same plane as the central warp-threads, of a warp-tension mechanism, for putting a tension on the central warp-threads to support the shuttle thereon, consisting of two parallel rolls, and rocking arms supporting said rolls, and means for rocking said arms, substantially as shown and described.

GEORGE F. HUTCHINS.

Witnesses:

J. C. DEWEY,
M. HAAS.