



No. 679,863.

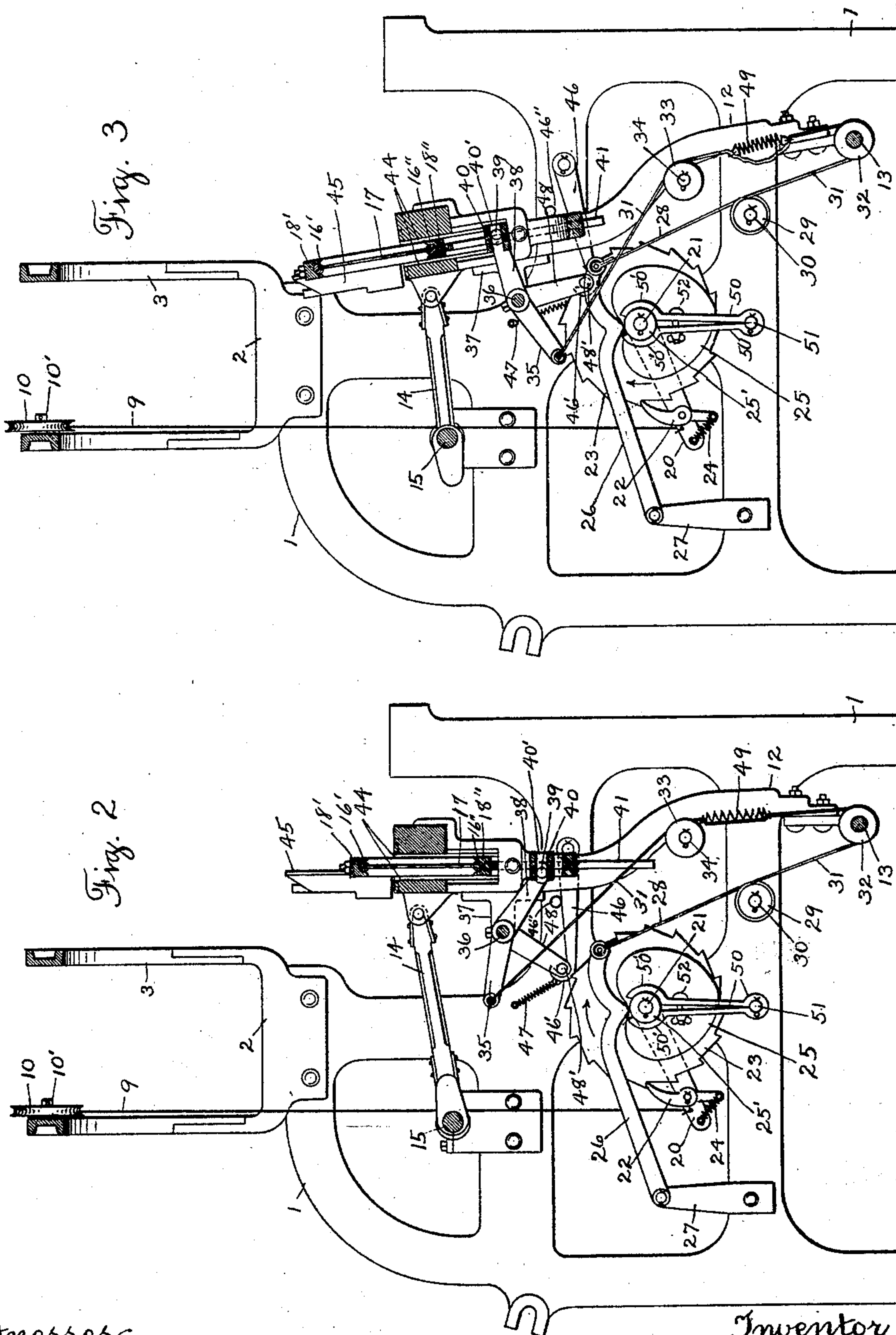
Patented Aug. 6, 1901.

E. H. RYON.  
REED MOTION FOR LOOMS.

(Application filed Apr. 1, 1901.)

(No Model.)

3 Sheets—Sheet 2.



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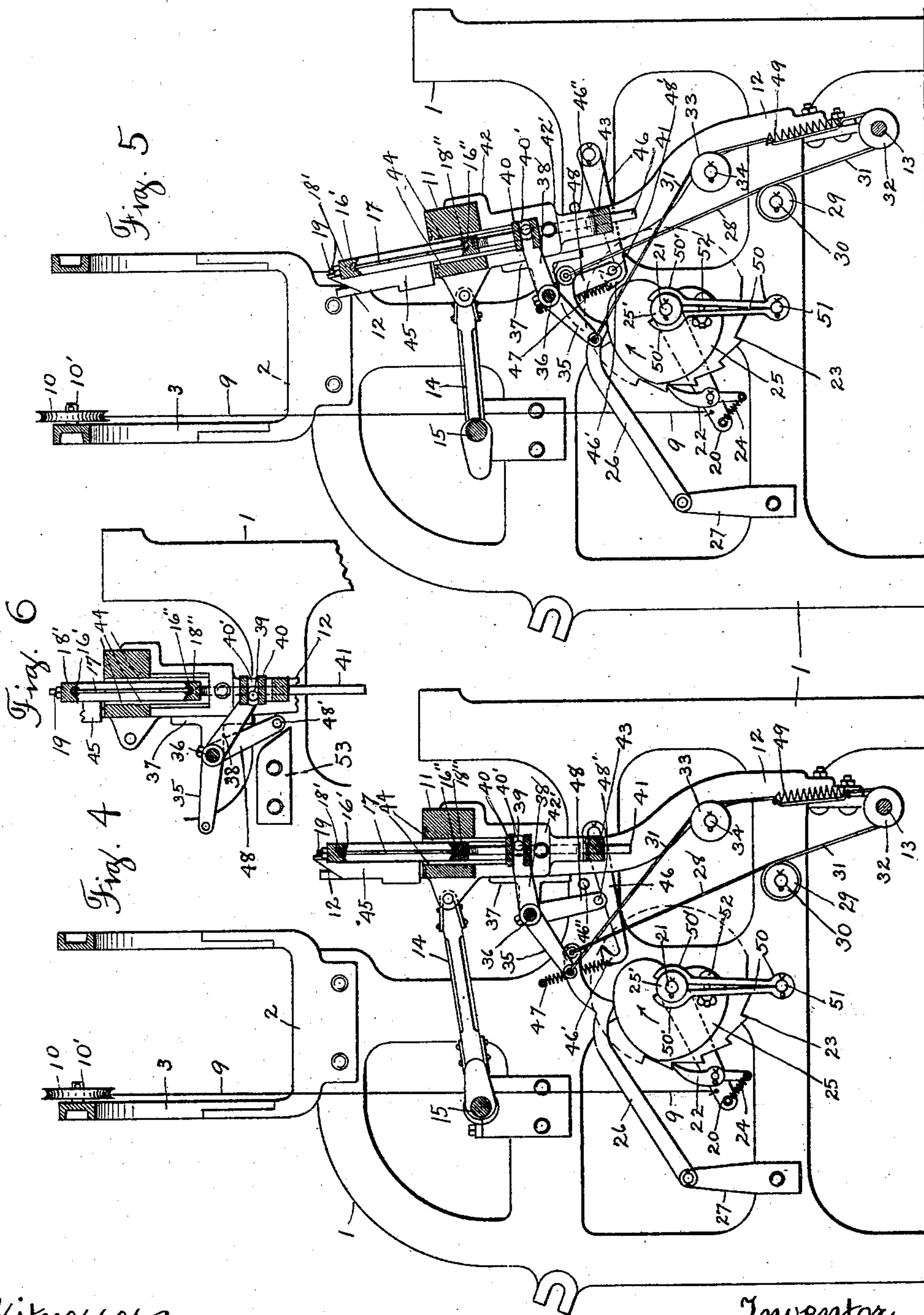
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# UNITED STATES PATENT OFFICE.

EPPA H. RYON, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO CROMPTON & KNOWLES LOOM WORKS, OF SAME PLACE.

## REED-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 679,863, dated August 6, 1901.

Application filed April 1, 1901. Serial No. 53,810. (No model.)

*To all whom it may concern:*

Be it known that I, EPPA H. RYON, 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 Reed-Motions for Looms, of which the following is a specification.

My invention relates to that class of looms for weaving textile fabrics in which the warp-threads extend in sinuous directions or curves in the plane of the fabric to produce a particular appearance in the fabric, which may be varied, if desired, according to the indications of the pattern-surface which governs the vertical movement of the reed.

The object of my invention is to provide improved means for operating the reed in weaving the class of fabrics above referred to.

In my improvements, in addition to the means for raising and lowering the reed according to the indications of the pattern-surface, I provide supplemental means for raising the reed on the backward stroke of the lay high enough to allow of the formation of the shed and the passage of the shuttle whenever on the backward stroke of the lay the reed is so low as to interfere with the formation of the shed and the passage of the shuttle.

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

Referring to the drawings, Figure 1 is a front view of portions of a loom sufficient to illustrate my improvements applied thereto. The lay-sword on the right is broken away to show the parts behind it. Fig. 2 is a vertical section on line 2 2, Fig. 1, looking in the direction of arrow *a*, same figure, showing the lay in its forward position. Fig. 3 corresponds to Fig. 2, but shows the lay in its rear position and the reed in its raised position. Fig. 4 corresponds to Fig. 2, but shows the reed in its raised position and the operating-cam and other parts in a different position. Fig. 5 corresponds to Fig. 3, but shows the operating-cam in a different position; and Fig. 6 shows a modified construction of the supplemental mechanism for raising the reed.

In the accompanying drawings, 1 represents the loom sides, 2 the arch-stands, and 3 the

arches. The dobbie-stand 4 in Fig. 1 is shown in section, and one jack or lever 5 is shown pivoted at its lower end and having thereon a centrally-pivoted lever 6, carrying the two hooked arms 7, which according to the pattern-surfaces (not shown) are engaged by the sliding bars 8 to move the jack 5, all in the ordinary way.

To the upper end of the jack 5 is attached one end of a cord 9, which passes over a pulley or sheave 10, mounted on the stud 10', and is connected at its other end to a pawl-carrying arm of the mechanism for controlling the movement of the reed to be hereinafter described.

The lay 11 is carried on the upper ends of the lay-swords 12, secured at their lower ends on the rock-shaft 13 and is connected through connector 14 with the crank-shaft 15 in the usual way.

The reed, which is higher than the ordinary reed, has the top rod or bar 16' and the bottom rod or bar 16'' and the dents 17 extending between the two bars and secured at their ends thereto. The dents 17 are arranged in sets or series, in which the dents extend at varying distances from each other from the top to the bottom of the reed. In one set the dents diverge at the top and converge at the bottom. In the next set the dents converge at the top and diverge at the bottom, and so on alternately, as shown in Fig. 1. All the dents are secured at their upper and lower ends, and the dent or dents at each end of the reed are parallel to each other.

The reed is secured in a frame which has a vertical motion through the lay to vary the position of the dents in the reed relative to the plane of the warp-threads. The frame consists of a top bar 18' and a bottom bar 18'', which are secured together at their ends by bolts 19 or otherwise.

I will now describe my improvements, which relate particularly to the means for operating the reed at the proper time. The cord 9, extending from the jack 5, is attached to the outer end of arm 20, loosely mounted at its inner end on a stud 21, fast in the loom side and carrying a pawl 22, held in engagement with a ratchet-wheel 23 by a spring 24. The ratchet-wheel 23 is mounted on the stud



21 and has secured thereto or integral therewith a cam 25 of the proper shape to communicate, through intermediate mechanism, the desired vertical movement to the reed.

5 A lever 26, pivoted at one end on a stand 27 on the loom side, extends over and bears on the periphery of the cam 25. To the free end of the lever 26 is attached the end of a cord or flexible connector 28. The other end

10 of said cord 28 is passed around and secured to the drum 29, loose on a pin 30 in the loom side. Also passing around in the opposite direction and secured to the drum 29 is the end of a cord or flexible connector 31, which

15 cord passes under a pulley 32, loose on the rock-shaft 13, and over a second pulley 33, loose on a pin 34 on the lay-sword, and is connected at its end to an arm 35, fast on a rock-shaft 36, mounted and turning in bearings 37 on the lay-swords 12. On the rock-

20 shaft 36 are fast two arms 38, each arm carrying a pin 39, which extends into and travels in a slot 40' in a collar 40, adjustably secured on a rod 41, extending down from the

25 lower bar 18'' on the reed-frame. (See Fig. 1.) Two brackets or stands 42 are secured to the lay, and to the downwardly-extending portions 42' thereon are secured the angle-irons 43, the outer ends of which form bearings for the vertically-moving rods 41. Also

30 to the downwardly-extending portions 42' are secured two guide-plates 44, which extend upward through the slot in the lay and act to guide the lower bar 18'' of the reed-frame in its vertical movement through the

35 lay. The guide-plates 44 are embedded in the lay with their bearing-surfaces for the lower bar 18'' of the reed-frame slightly raised beyond the edges of the slot. Upon the up-

40 per ends of the lay-swords 12, at each extremity of the reed, are secured the guide-plates 45 to guide the upper bar 18' of the reed-frame. It will be seen that as the ratchet-wheel 23 and the cam 25 are revolved in the direction

45 of the arrow, Figs. 2, 3, 4, and 5, by the movement of the pawl-carrying arm 20, operated by the jack 5 through the connector 9, the reed-frame and reed will be gradually and positively raised from the position shown in

50 Fig. 2 to the position shown in Fig. 4 through the lever 26, connector 28, drum 29, connector 31, arm 35, rock-shaft 36, arms 38, and collars 40 upon the rods 41. After the reed has been raised to its highest position it will

55 be gradually lowered by gravity by the continued revolution of said ratchet-wheel 23 and cam 25 to its lowest position. (Shown in Fig. 1.) When the reed is in its lowered position, as shown in Fig. 2, there will not be sufficient clearance on the backward stroke of

60 the lay for the formation of the shed and the passage of the shuttle, and I therefore provide supplemental automatic mechanism for raising the reed on the backward stroke of

65 the lay to produce an additional upward movement of the reed to allow of the formation of the shed and the passage of the shut-

tle. In this instance I employ an arm 46, pivoted at one end on the loom side and having a hook 46' on its other end. A spring 47

70 holds the hook-arm 46 in position. In connection with the hook-arm 46 I employ an arm 48, fast on the rock-shaft 36, and carrying a pin 48', which extends over and in the path of the hook-arm 46. A stop 46'' operates

75 to check the upward movement of the hook-arm 46. When the reed is in its lowered position, as shown in Fig. 2, so that on the backward stroke of the lay there will not be sufficient clearance for the formation of the shed

80 and the passage of the shuttle, the pin 48' on the arm 48 will on the backward stroke of the lay be engaged by the hook 46' on the arm 46 and checked or held and cause the rock-shaft

85 36 to rotate as the lay moves back, and through arms 38, fast on said shaft, raise the reed to the position shown in Fig. 3. A spring 49, secured at each end to the cord 31,

90 may be employed to take up the slack in the cord 31, caused by the raising of the reed, as above described, as shown in Fig. 3. On the forward movement of the lay the weight of the reed will cause it to return to its proper lowered position, as shown in Fig. 2. When

95 the reed is in its raised position, so that there is a clearance for the formation of the shed and the passage of the shuttle on the backward stroke of the lay, then the pin 48' on the arm 48 will slide or travel upon the upper

100 edge of the hook-arm 46, as shown in Figs. 4 and 5, without causing the rock-shaft 36 to rotate and the reed to be raised by the engagement of the hook 46' with the pin 48' on the arm 48.

I may use a friction device for the ratchet-wheel 23 and the cam 25, which is shown in

105 this instance as consisting of two jaws 50, mounted on the stud 51, and having circular parts 50', engaging the hub 25' on the cam 25 and held in engagement therewith by the

110 bolt 52.

In Fig. 6 is shown a modified construction of the supplemental means for raising the reed on the backward stroke of the lay, so that there will be sufficient clearance for the

115 formation of the shed and the passage of the shuttle. Instead of the hook-arm 46 a cam-plate or inclined surface 53, bolted to the loom side, is employed. The edge of the plate 53 extends in the path of and will be engaged

120 by the pin 48' on the arm 48 when the reed is in its lowered position on the backward stroke of the lay, as shown in Fig. 6, and cause the rock-shaft 36 to rotate and the reed to be raised. When the cam 25 has been advanced

125 sufficiently to allow the formation of the shed on the backward stroke of the lay, the pin 48' on the arm 48 will be held out of engagement with the cam-plate 53.

From the above description, in connection

130 with the drawings, the operation of my improvements will be readily understood by those skilled in the art.

The reed will be positively raised by the



revolution of the cam 25 through intermediate connections and in the continued revolution of the cam will be lowered to vary the position of the dents relative to the plane of the fabric to produce the desired sinuous lines or curves in the fabric. When the lowered position of the reed is such that there is not sufficient clearance for the formation of the shed and the passage of the shuttle on the backward stroke of the lay, then through the engagement of the hook-arm 46 with the pin 48' on the arm 48, as above described, the reed will be raised sufficiently on the backward stroke of the lay for the formation of the shed and the passage of the shuttle.

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

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, the combination of the lay, means for operating it, a vertically-movable reed mounted on said lay, pattern mechanism for varying the vertical position of the reed on the lay, means operative only on the backward movement of the lay in case the reed is not at the upward limit of its travel to positively raise the reed to enable the shed to be formed.

2. In a loom of the class described, the combination with the lay, and a vertically-moving reed having dents arranged at varying distances from each other, of means for positively raising the reed, and allowing the lowering of the reed by gravity, to gradually vary the position of the dents, relative to the plane of the fabric, and supplemental means operative only on the backward movement of the lay for positively raising the reed, to produce an additional upward movement of the reed, to allow of the formation of the shed and the passage of the shuttle, substantially as shown and described.

3. In a loom of the class described, the combination with the lay, and a vertically-moving reed having dents arranged at varying distances from each other, of means for moving the reed, to gradually vary the position of the dents relative to the plane of the fabric, said means consisting of a driven cam or pattern surface, a lever operated by said cam, flexible connections from said lever to an arm fast on a rock-shaft, and said arm and

rock-shaft, and two arms fast on said rock-shaft and carrying pins engaging slotted collars on rods extending down from the reed-frame, and said collars and rods, substantially as shown and described.

4. In a loom of the class described, the combination with the lay, and a vertically-moving reed having dents arranged at varying distances from each other, of means for moving the reed, to gradually vary the position of the dents relative to the plane of the fabric, said means consisting of a driven cam or pattern surface, a lever operated by said cam, connections from said lever to an arm fast on a rock-shaft, and said arm and rock-shaft, and two arms fast on said rock-shaft and carrying pins engaging slotted collars on rods extending down from the reed-frame, and said collars and rods, and supplemental means for positively raising the reed on the backward stroke of the lay, to produce an additional upward movement of the reed, to allow of the formation of the shed and the passage of the shuttle, substantially as shown and described.

5. In a loom of the class described, the combination with the lay, and a vertically-moving reed having dents arranged at varying distances from each other, of means for moving the reed to gradually vary the position of the dents relative to the plane of the fabric, said means consisting of a driven cam or pattern surface, a lever operated by said cam, connections from said lever to an arm fast on a rock-shaft, and said arm and rock-shaft, and two arms fast on said rock-shaft and carrying pins engaging slotted collars on rods extending down from the reed-frame, and said collars and rods, and supplemental means for raising the reed on the backward stroke of the lay, to produce an additional upward movement of the reed, to allow of the formation of the shed and the passage of the shuttle, said additional means consisting of an arm fast on the rock-shaft above mentioned, and a device extending in the path of and adapted to engage said arm on the backward stroke of the lay, and through said arm to rotate said rock-shaft and raise the reed, substantially as shown and described.

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