

No. 667,582.

Patented Feb. 5, 1901.

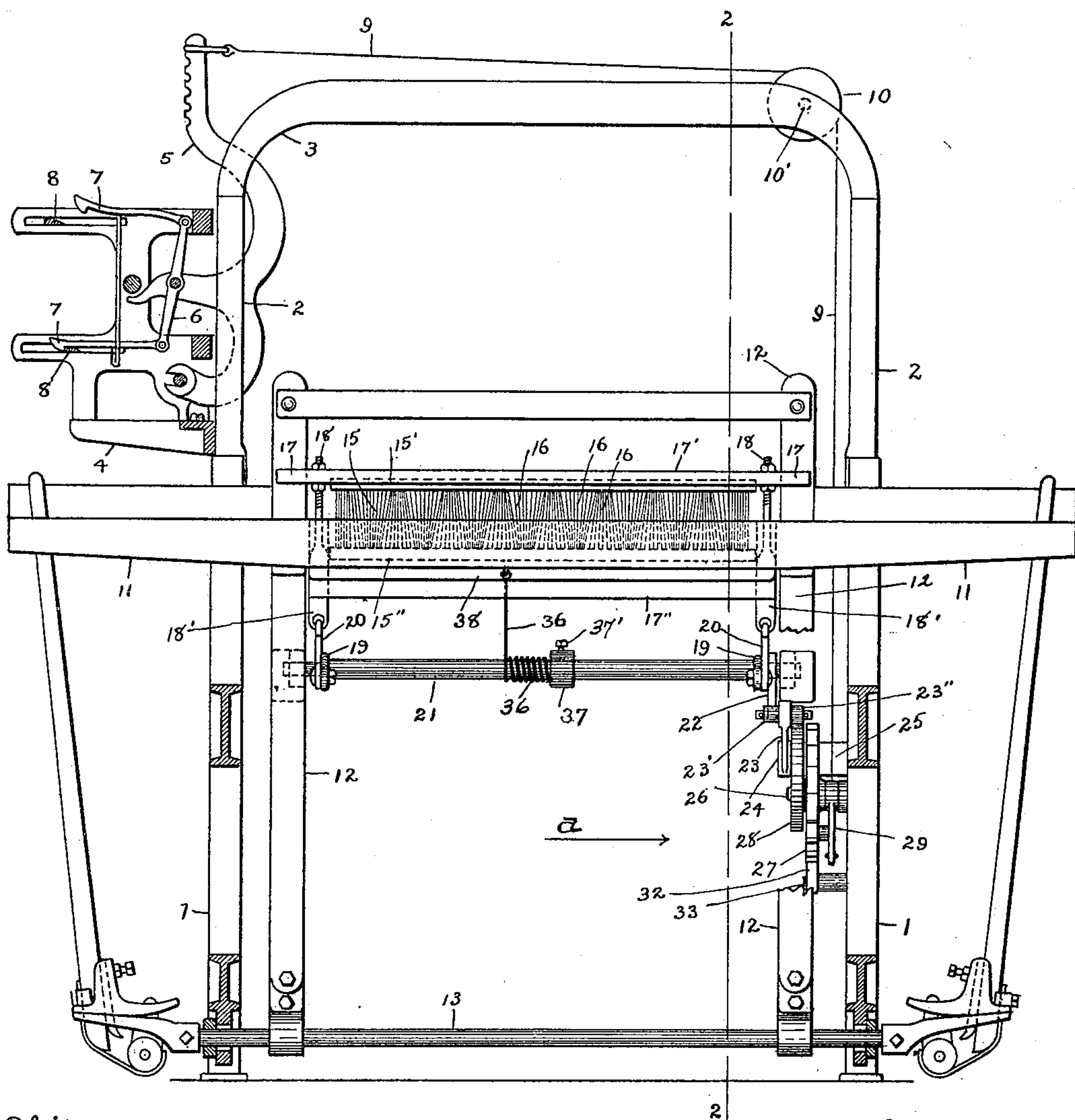
E. H. RYON.  
REED MOTION FOR LOOMS.

(Application filed May 26, 1900.)

(No Model.)

4 Sheets—Sheet 1.

Fig. 1.



Witnesses  
J. A. Kinsley  
M. Haas.

Inventor.  
Eppa H. Ryon  
By Attorney  
John C. Dewey

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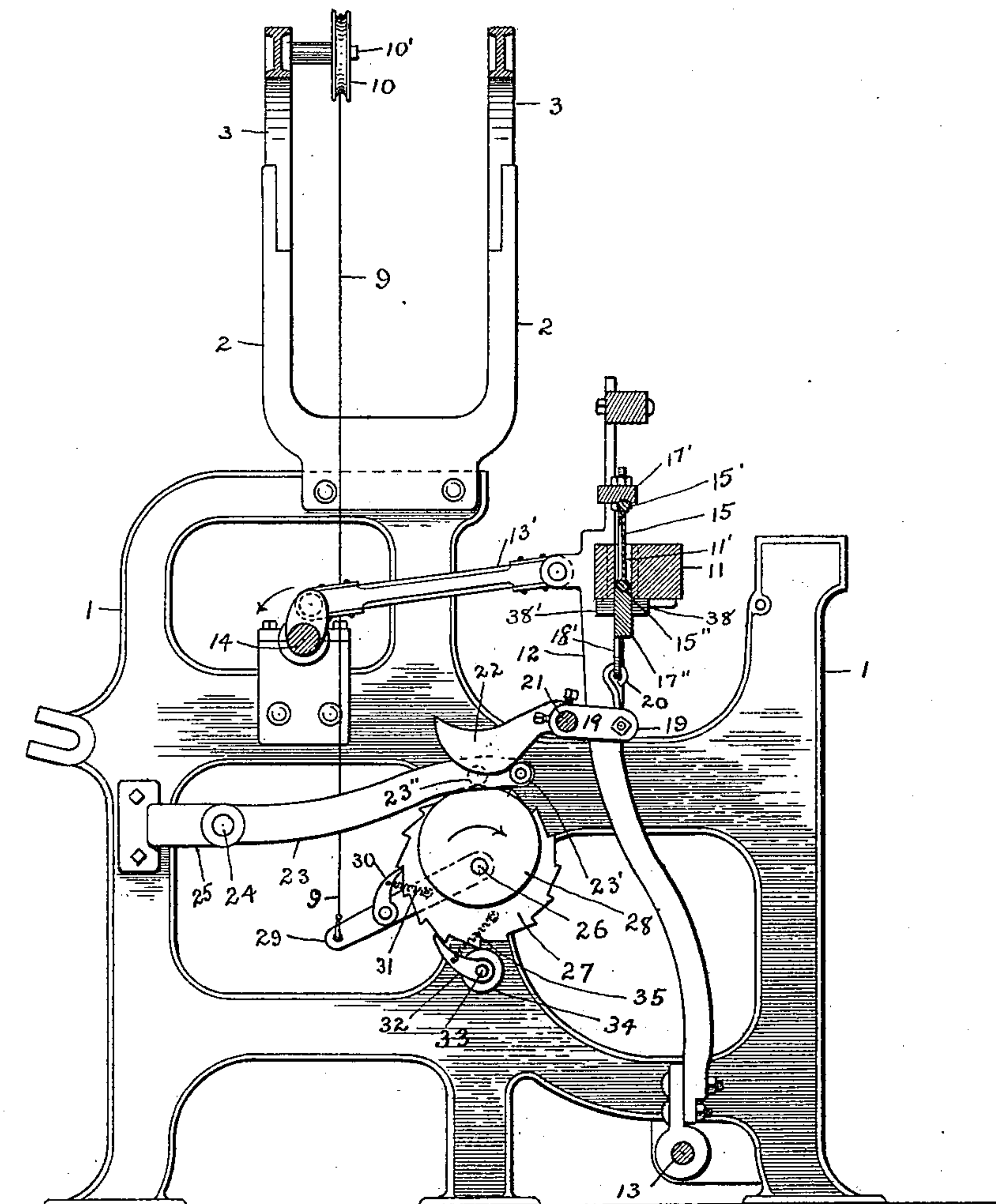
E. H. RYON.  
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Fig. 2



Witnesses  
J. A. Kinsley  
M. H. Lee.

Inventor  
Eppa H. Ryon  
By Attorney  
John C. Dewey.

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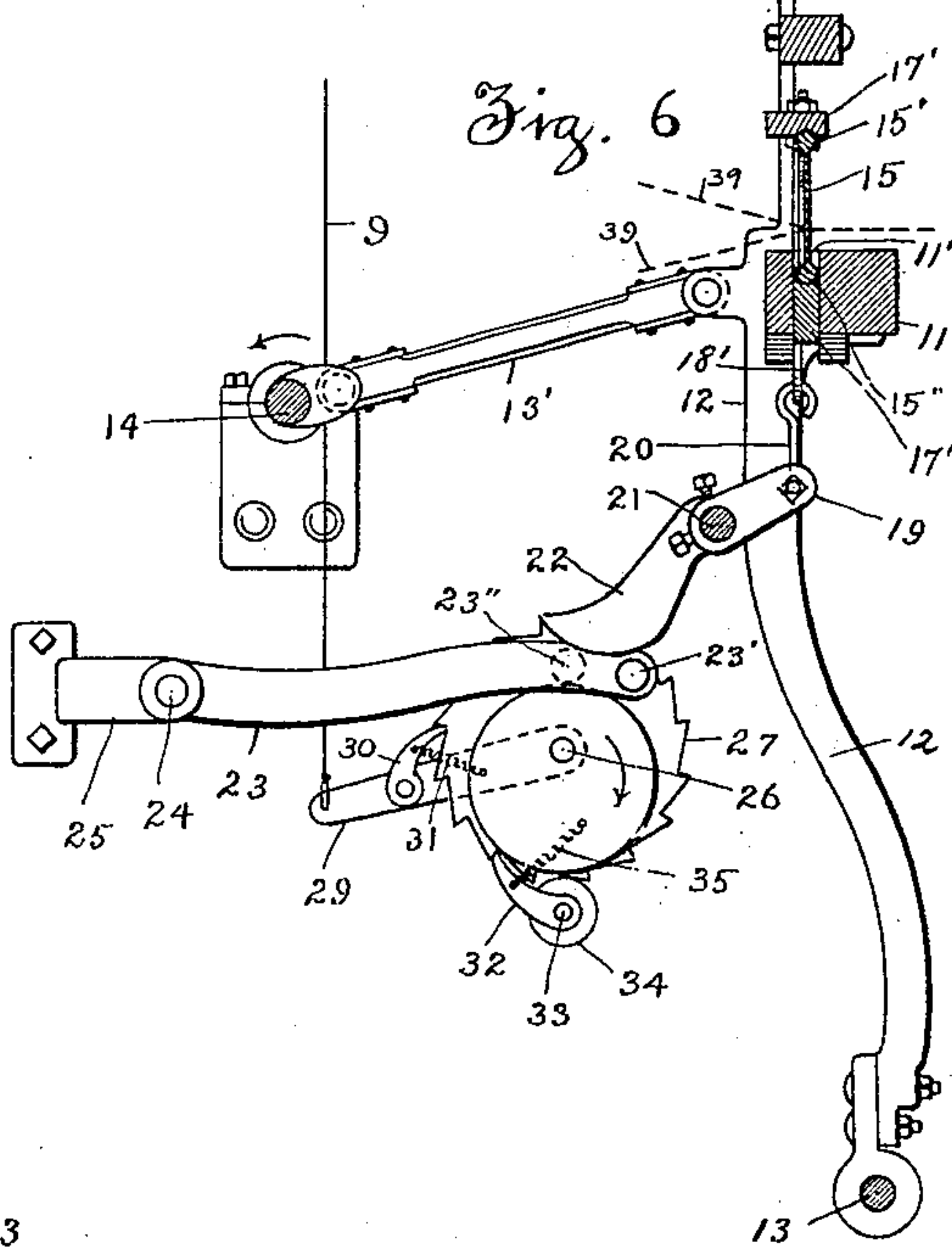
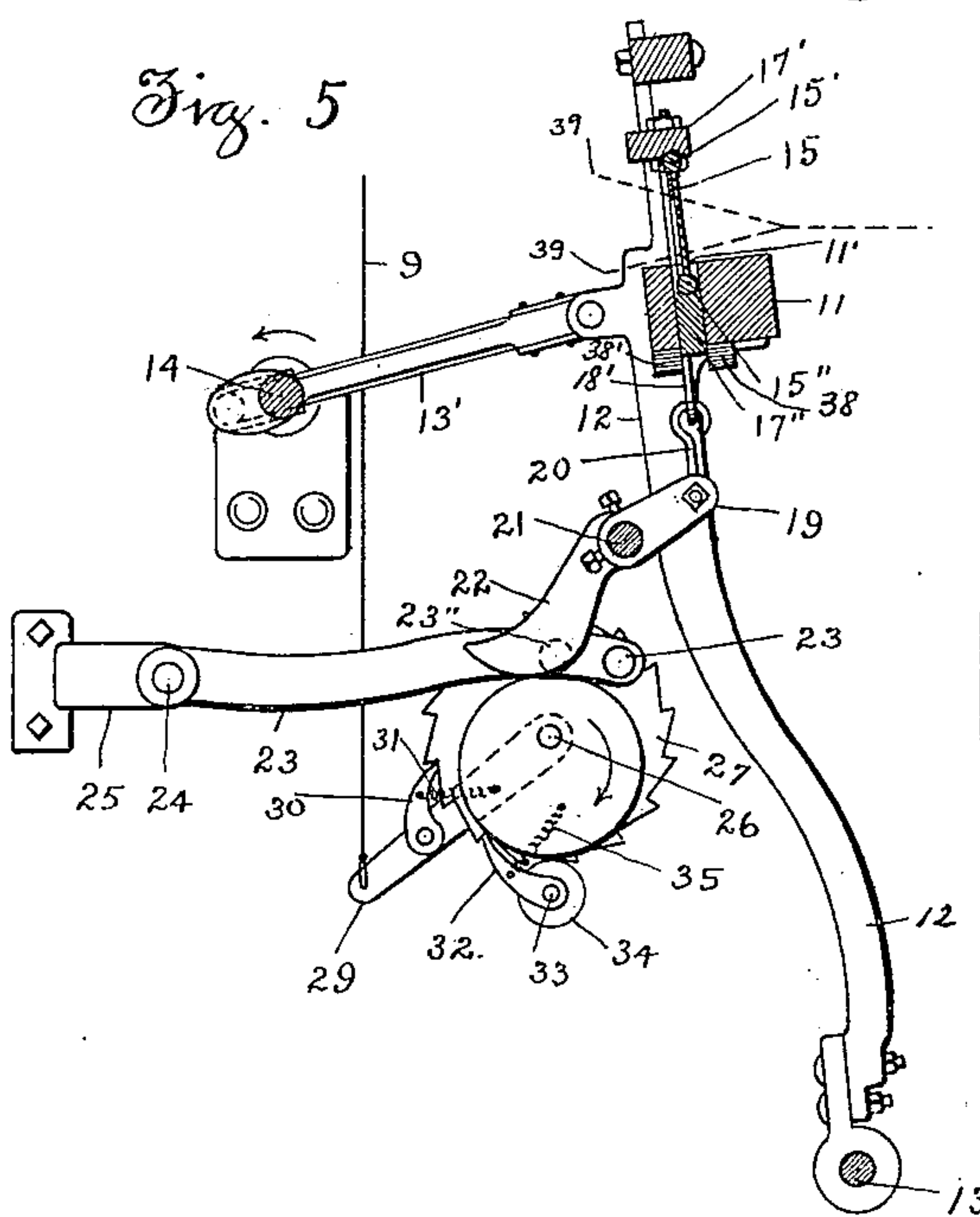
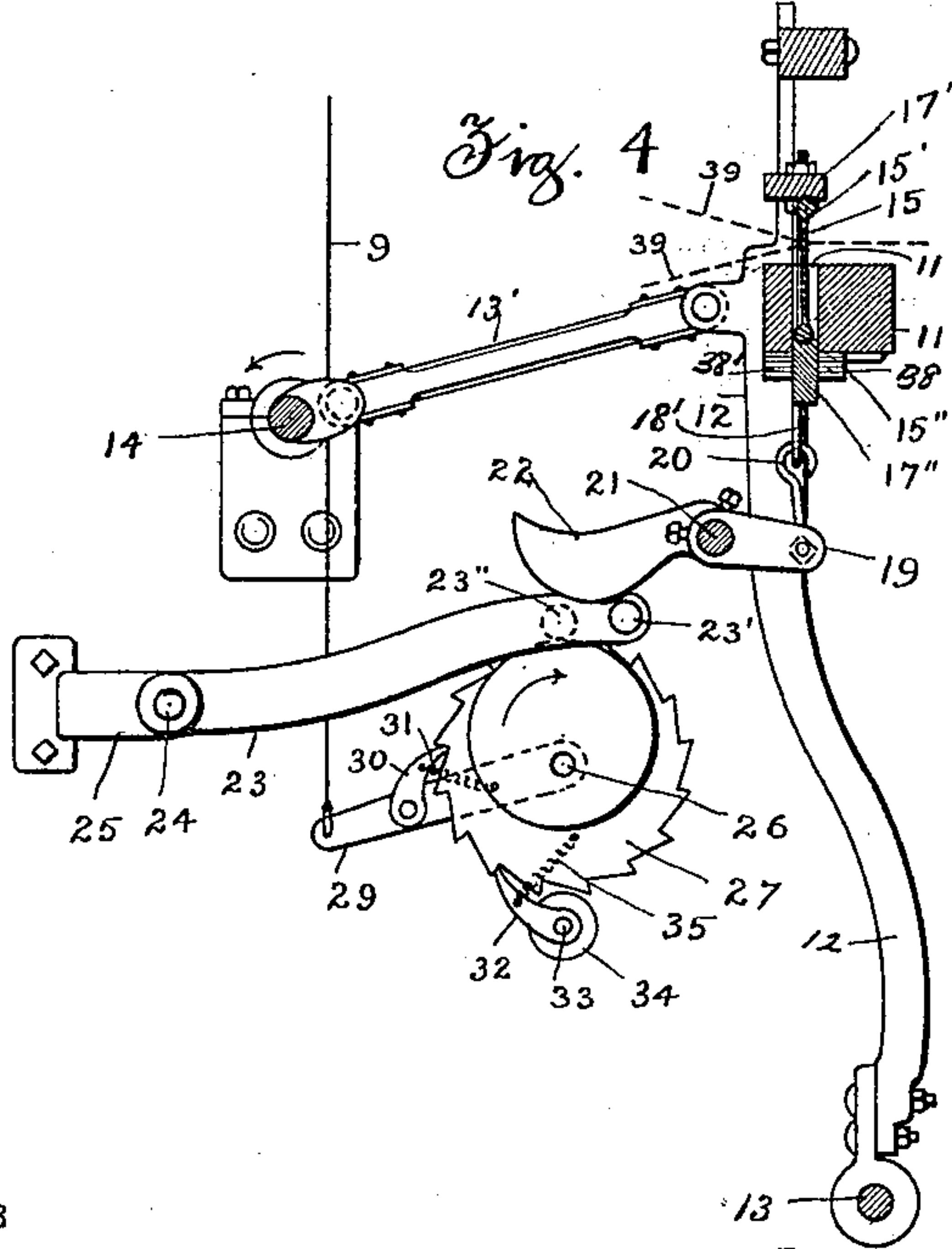
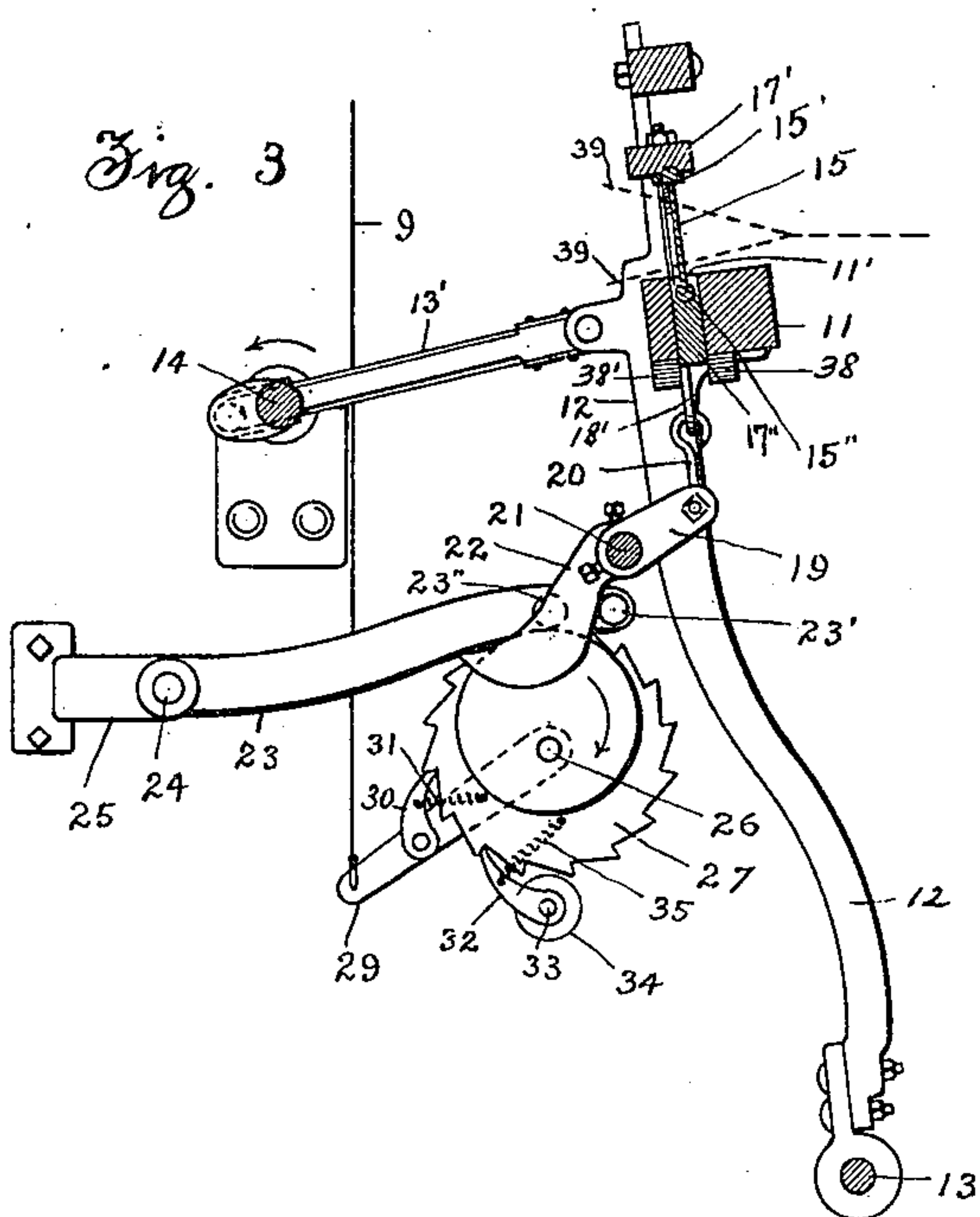
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(No Model.)

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Witnesses  
J. A. Kinsley  
M. Haas.

Inventor  
Eppa H. Ryon  
By Attorney  
John C. Dewey



No. 667,582.

Patented Feb. 5, 1901.

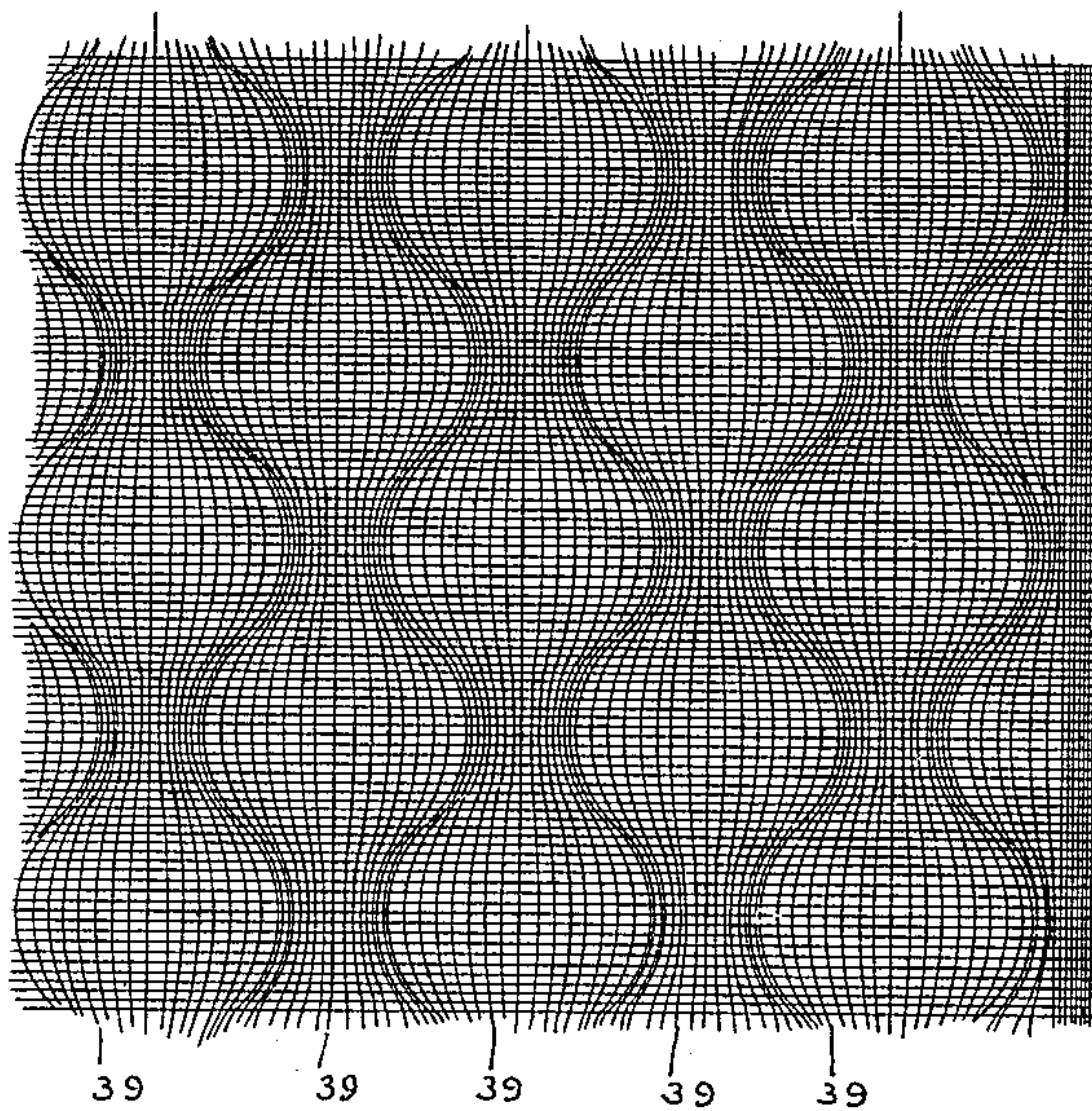
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(Application filed May 26, 1900.)

(No Model.)

4 Sheets—Sheet 4.

*Fig. 7*



Witnesses  
S. A. Kinsky  
M. Haas

Inventor  
Eppa H. Ryon  
By Attorney  
John C. Dewey



# UNITED STATES PATENT OFFICE.

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

## REED-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 667,582, dated February 5, 1901.

Application filed May 26, 1900. Serial No. 18,051. (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 looms for weaving textile fabrics; and the object of my invention is to provide improved means for weaving fabric in which the warp-threads will extend in sinuous directions or curves in the plane of the fabric, to produce a special design or 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.

In carrying out my invention I use a reed of the ordinary height, but the dents are arranged at varying distances apart from the top to the bottom of the reed. The reed is supported in a frame which has a vertical motion on the lay, and on every backward stroke of the lay the reed is moved to its highest position to allow the full opening of the shed for the shuttle to pass through. On the forward beat of the lay the position of the reed relative to the warp-threads passing through it varies according to the pattern of the fabric to be woven, in the manner to be hereinafter described.

Referring to the drawings, Figure 1 is a sectional front view of portions of a loom sufficient to illustrate my improvements applied thereto. Fig. 2 is a vertical section on line 2 2, Fig. 1, looking in the direction of arrow *a*, same figure. Fig. 3 shows a sectional view of the lay detached and the means for operating the reed. The lay is shown at its extreme rear position. Fig. 4 corresponds to Fig. 3, but shows the lay at its extreme forward position. Fig. 5 corresponds to Fig. 3, but shows the pattern-cam for moving the reed in its opposite position. Fig. 6 corresponds to Fig. 4, but shows the pattern-cam for moving the reed in its opposite position; and Fig. 7 is a plan view of a detached portion of woven fabric, showing the design or effect which may be produced by my improvements.

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

the arch. The dobby-stand 4 is shown in section, and one jack or lever 5 is shown pivoted at its lower end and having thereon the centrally-pivoted lever 6, carrying the two hooked arms 7, which, according to the pattern-surface, (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 grooved pulley or sheave 10, mounted on a stud 10', and is connected at its other end to a pawl-carrying arm of the mechanism for controlling the movement of the reed, as will be hereinafter fully 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 13' with the crank-shaft 14 in the ordinary way.

I will now describe my improvements, which relate particularly to the reed and means for communicating vertical motion thereto.

The reed 15, which is the height of the ordinary reed, has the top rod or bar 15' and the bottom rod or bar 15'' and the dents 16, extending between the two bars and secured at their ends thereto. The dents at the ends of the reed are arranged parallel to each other and at equal distances apart. The intermediate dents 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.

The reed 15 is secured in a frame 17, which has a vertical motion on the lay to vary the position of the dents in the reed relatively to the plane of the warp-threads. The frame 17 consists of a top bar 17' and bottom bar 17'', secured together at their ends by bolts 18 or otherwise. The lower bar 17'' extends and travels in a vertical plane in a longitudinal vertical slot 11' in the lay 11, as shown.

I have shown in the drawings one form of mechanism for communicating a positive downward motion on the forward beat of the lay to the frame 17, carrying the reed 15.



The mechanism shown in the drawings for moving down the frame 17 consists of a rock-shaft 21, journaled at its ends in bearings on the lay-swords 12 and having fast thereon two arms 19, connected by links 20 with downward projections 18' on the bolts 18. Also fast on the shaft 21, at one end thereof, is a cam-arm 22, which extends in the path of and is adapted to be engaged on its lower edge by a roll 23' on a lever or arm 23, pivoted at 24 to a stand 25 on the loom-frame. (See Fig. 2.) On a stud 26, fast in a stand secured to the loom-frame, is mounted a ratchet-wheel 27 and a pattern-cam 28, secured thereto to rotate therewith. An arm 29, carrying a pawl 30, is pivoted at one end on the stud 26 and is connected at its other end with the cord 9. The pawl 30 is held in engagement with the teeth of the ratchet-wheel 27 by a spring 31, and as the arm 29 is raised by the movement of the jack 5 through cord 9 rotating motion is communicated to the ratchet-wheel 27 and to the pattern-cam 28 to raise or lower the arm 23, which has a roll 23'' thereon, which travels on the periphery of the cam 28. A hold-fast pawl 32, pivoted on a pin 33 in a stand 34 on the loom-frame and actuated by a spring 35, is used to prevent any reverse motion of the ratchet-wheel 27. (See Fig. 2.) To move the frame 17, supporting the reed 15, to carry the reed to its highest position at each backward stroke of the lay, I employ in this instance a spiral spring 36, which is mounted on the rock-shaft 21 and is secured at one end to the collar 37, adjustable on said shaft 21 by a thumb-screw 37' to vary the tension of the spring, and secured at its other end in this instance to the plate 38, extending upon the under side of the lay, between which and a second parallel plate 38' the lower end of the frame 17 travels and is guided, as shown. The spring 36 operates to rotate the shaft 21 and through connections between said shaft and the frame 17 to move said frame and the reed 15 to its highest position at each backward stroke of the lay.

The vertically-moving frame 17, carrying the reed 15, is moved to its highest position on each backward stroke of the lay to permit the formation of a shed or opening between the warp-threads 39 of sufficient width to allow the passage of the shuttle, as shown in Figs. 3 and 5.

The operation of the mechanism for giving a vertical movement to the movable frame 17, carrying the reed 15, will readily be understood from the above description, in connection with the drawings, by those skilled in the art.

By the movement of the jack 5, through cord 9, arm 29, and pawl 30, the ratchet-wheel 27, carrying the pattern-cam 28, is rotated to vary the position of said cam 28 relative to

the arm 23, having the roll 23'' riding on the periphery of said cam. The position of the arm 23, having the second roll 23' thereon, which engages the cam-arm 22 on the forward beat of the lay, controls the movement of said cam-arm 22, the rock-shaft 21, and the movable frame 17, connected with said shaft and carrying the reed 15. When the arm 23 is in the position shown in Fig. 3, the forward beat of the lay will cause the cam-arm 22 to travel on the roll 23' from the position shown in Fig. 3 to the position shown in Fig. 4 to draw down the frame 17 and reed 15 to its lowest position. When the arm 23 is in the position shown in Fig. 5, the pattern-cam 28 being in its opposite position, the forward beat of the lay will cause the cam-arm 22 to move over the roll 23' without moving said arm, allowing the spring 36 to act to rotate the shaft 21 and raise the frame 17 and reed 15 to its highest position, as shown in Fig. 6. There will be a gradual lowering of the frame 17 and reed 15 on the forward beats of the lay intermediate the extreme positions shown in Figs. 4 and 6 in the operation of the loom to regulate the position of the warp-threads 39 and produce the sinuous lines shown in Fig. 7, while on each backward stroke of the lay the frame 17 and reed 15 will be raised to its highest position.

It will be understood that the details of construction of the mechanism for moving the frame 17 and reed 15 may be varied, if desired, and instead of moving the reed in a vertical plane the reed may be stationary and the fabric itself be given a movement in a vertical plane.

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

1. In a loom, the combination with the lay, and a vertically-moving frame carrying the reed, having dents arranged at varying distances from each other, from the top to the bottom of the reed, of means for gradually lowering said frame on the forward beats of the lay, and means for raising said frame and reed to their highest positions on each backward stroke of the lay, substantially as shown and described.

2. In a loom, the combination with the lay, and a vertically-moving reed having dents arranged at varying distances from each other, from the top to the bottom of the reed, and means for gradually lowering the reed on the forward beats of the lay, of means for raising the reed to its highest position on each backward beat of the lay, substantially as shown and described.

EPPA H. RYON.

Witnesses:

J. C. DEWEY,  
M. HAAS.