

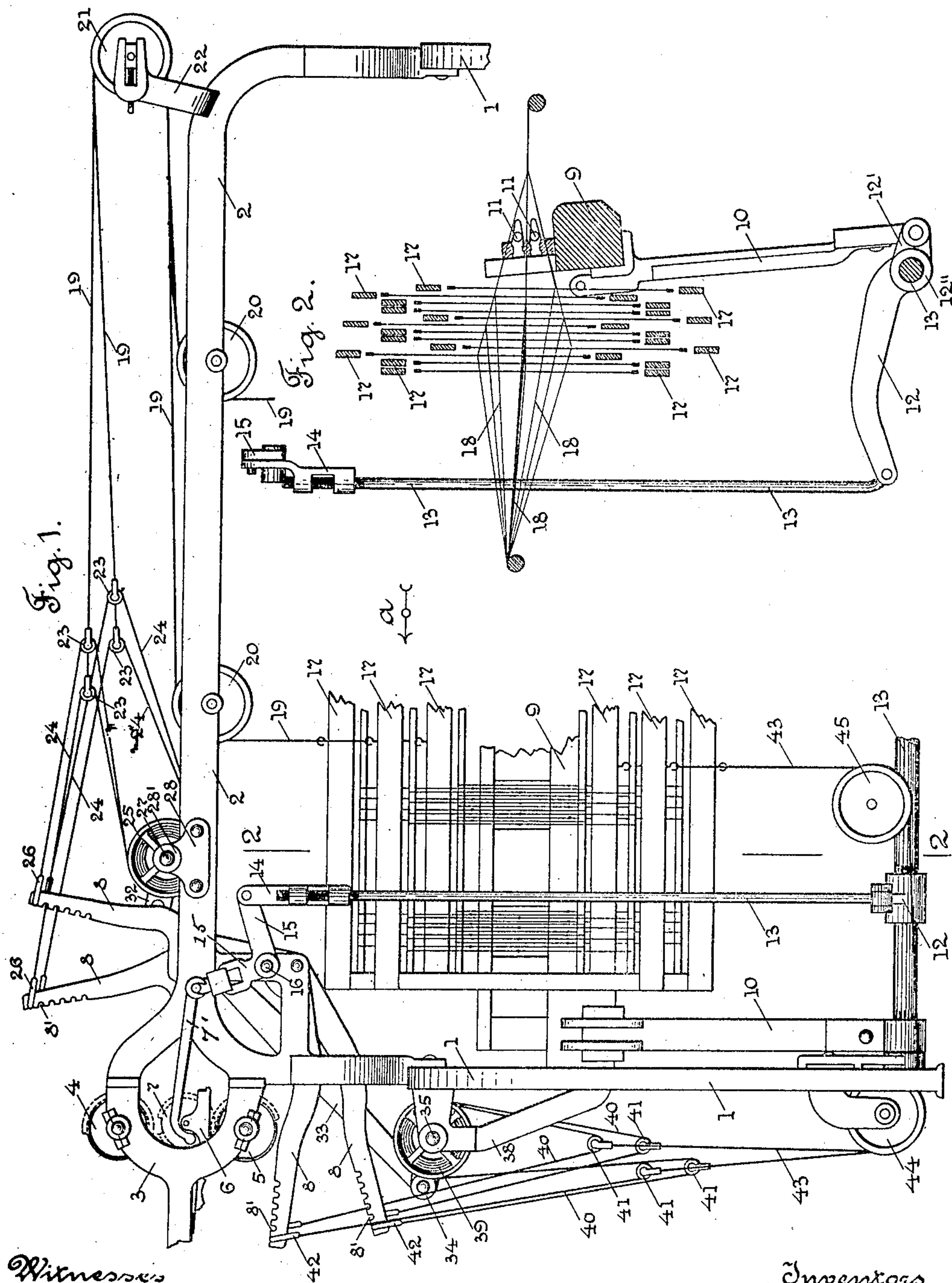
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PATENTED JAN. 14, 1908.

E. R. HOLMES & A. S. COWAN.  
LOOM SHEDDING MECHANISM.

APPLICATION FILED JUNE 18, 1906.

3 SHEETS—SHEET 1.



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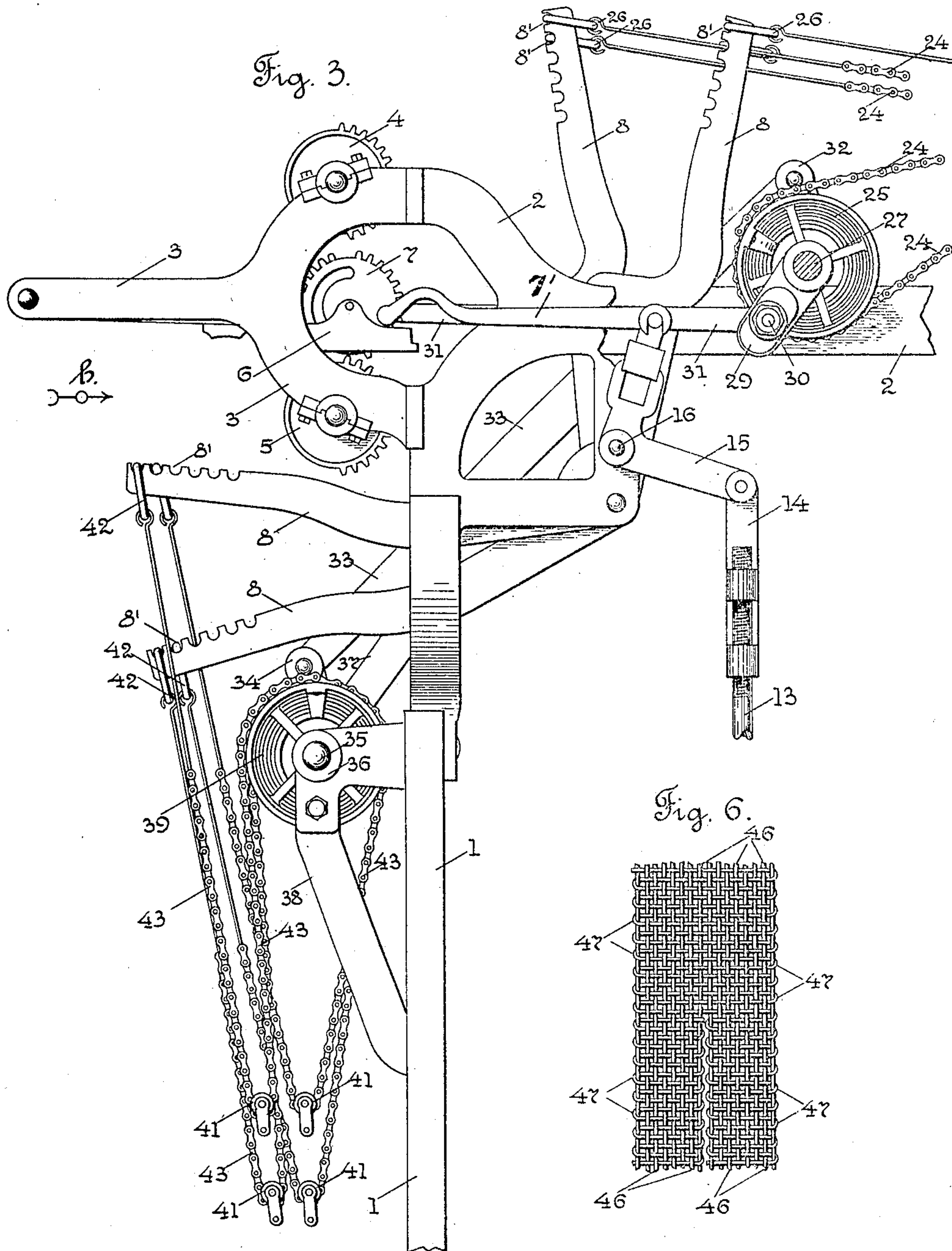
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3 SHEETS—SHEET 2.



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3 SHEETS—SHEET 3.

Fig. 4.

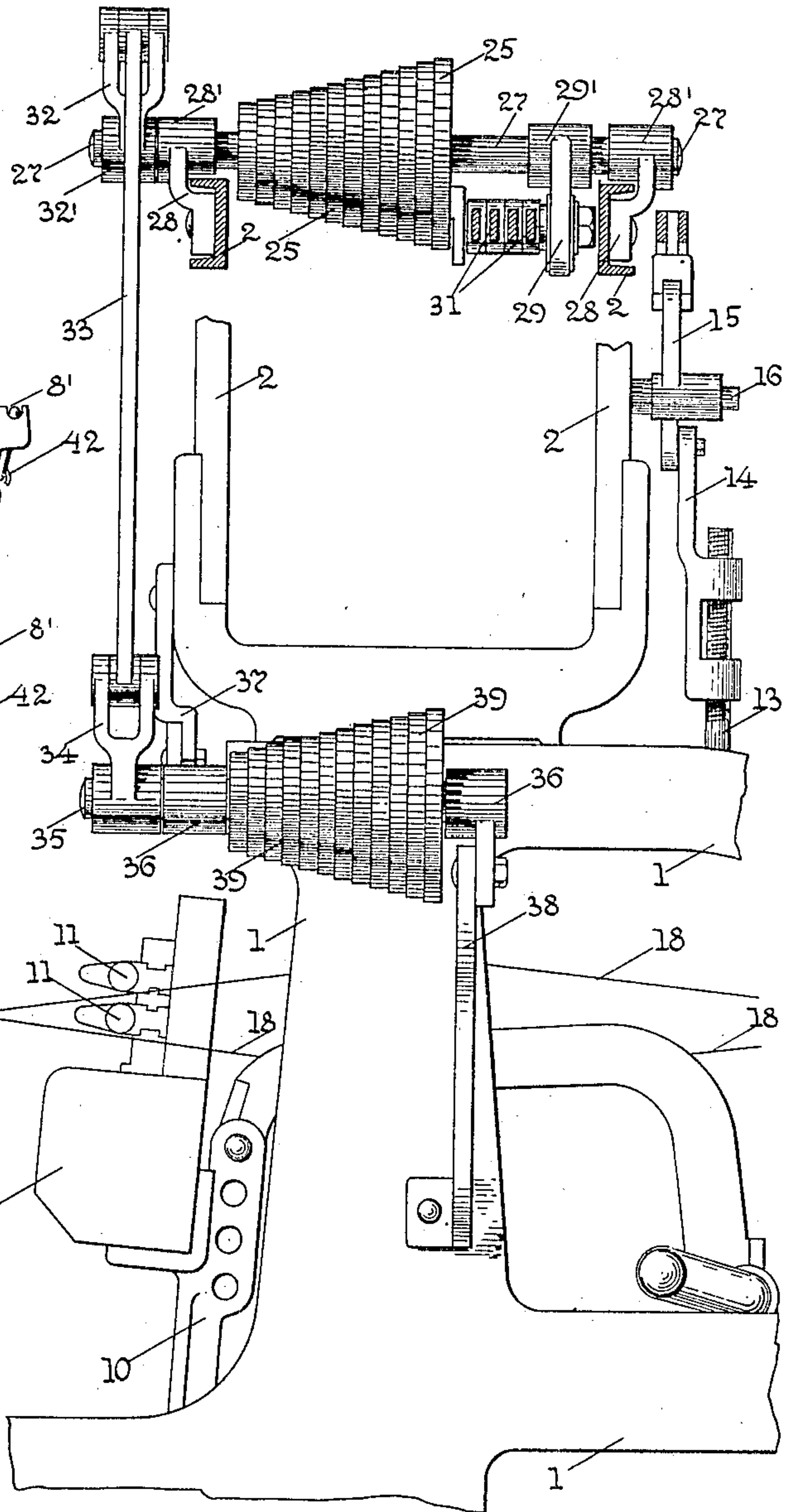
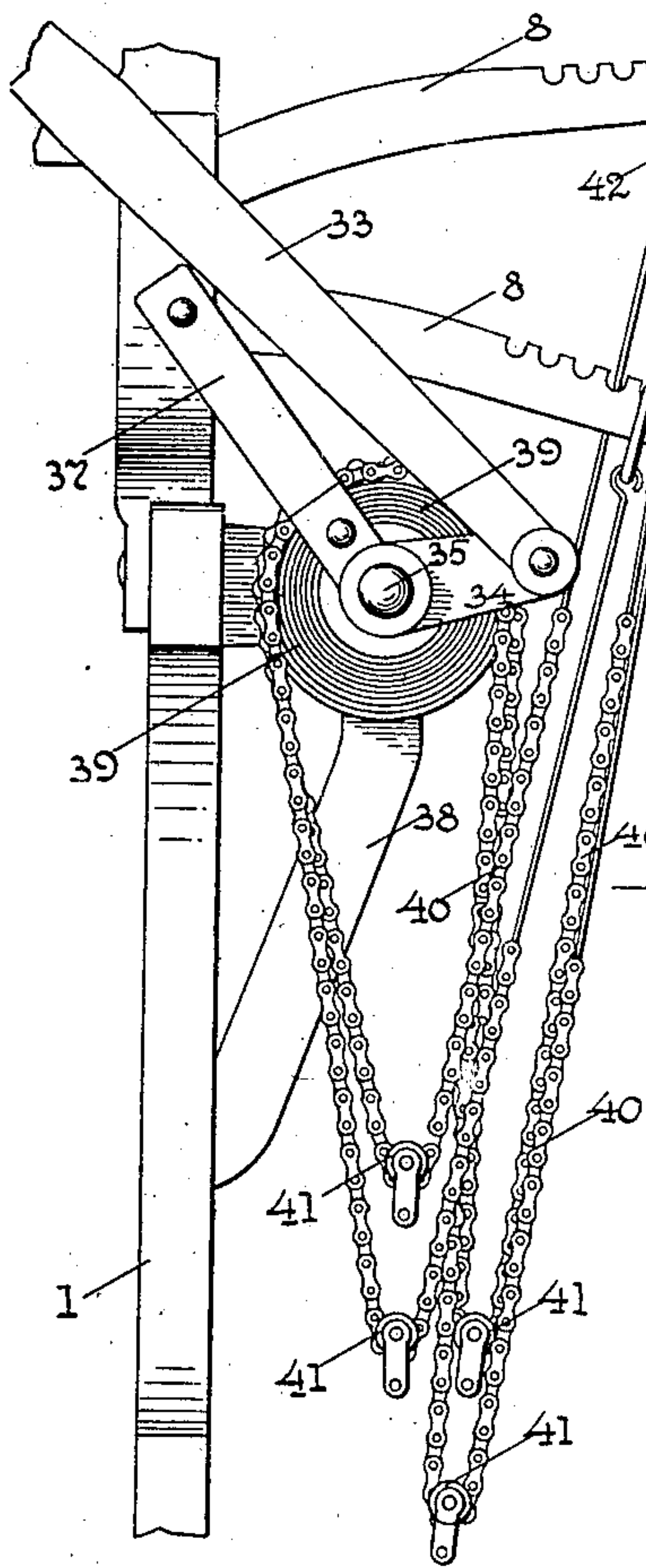


Fig. 5.



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# UNITED STATES PATENT OFFICE.

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## LOOM SHEDDING MECHANISM.

No. 876,353.

Specification of Letters Patent.

Patented Jan. 14, 1908.

Application filed June 18, 1906. Serial No. 322,126.

*To all whom it may concern:*

Be it known that we, ELBRIDGE R. HOLMES and ARTHUR S. COWAN, citizens of the United States, residing at Worcester, in the county of Worcester and State of Massachusetts, have jointly invented certain new and useful Improvements in Loom Shedding Mechanism, of which the following is a specification.

Our invention relates to shedding mechanism for looms, and particularly to shedding mechanism for narrow ware or tape looms which have two banks of swivel shuttles, and a drop shuttle lay, and in which a single shed, and a split or double shed is produced, for making suspenders, and other woven fabrics, with a split in the fabric, or with button-holes, etc.

The object of our invention is to improve upon the ordinary construction of shedding mechanism in the class of looms referred to.

In our improvements, we use a cone or cones in connection with the ordinary harness motion, for producing a single shed, and split or double shed.

Our invention consists in certain novel features of construction of our improvements as will be hereinafter fully described.

We have only shown in the drawings sufficient portions of the shedding mechanism of a loom, with our improvements combined therewith, to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings:—Figure 1 is a rear view of the shedding mechanism and our improvements combined therewith. Fig. 2 is a section through the harnesses and lay, on line 2, 2, Fig. 1, looking in the direction of arrow *a*, same figure. Fig. 3 shows, on an enlarged scale, the parts shown at the left in Fig. 1; some of the parts are in a different position, and the loom arch is broken out in this figure. Fig. 4 is an end and sectional view of the parts shown in Fig. 3, looking in the direction of arrow *b*, same figure; the head motion, harness levers and connections are not shown in this figure, but the lay is shown. Fig. 5 is an opposite view of the parts shown in the lower part of Fig. 3, and shows the forming of the split or double shed, and, Fig. 6 shows a piece of fabric with a split or double end, and intended to be woven by our improved shedding mechanism.

In the accompanying drawings, 1 are por-

tions of the loom sides or ends; 2 are the loom arches, 3 the head motion frame. The head motion for operating the harnesses is of the ordinary Knowles type, shown and described in reissue U. S. Letters Patent, No. 7,784, and comprising as a part thereof the upper cylinder gear 4, the lower cylinder gear 5, the vibrator levers 6, the vibrator gears 7 mounted on the vibrator levers 6, and the vibrator connectors, not shown, to the harness levers or jacks 8, all in the usual way.

The lay 9 is supported on lay swords 10, only one is shown, and carries two banks of shuttles 11, see Figs. 2 and 4. The lower end of the lay sword 10 is pivotally attached to an arm or projection 12' on a hub 12'' of an arm 12. Said hub 12'' is fast on a rock shaft 13' mounted in suitable bearings. The arm 12 is pivotally connected to the lower end of a rod or connector 13; the upper end of said rod 13 is adjustably connected with a link 14, pivotally attached to one arm of an angle or bell crank lever 15, pivotally mounted on a pin 16 on a stationary part of the frame, see Fig. 3. The other arm of the angle lever 15 is connected with a vibrator connector 7'. The movement of the vibrator connector, through the rotation of a vibrator gear 7, according to the indication of the pattern surface, not shown, will raise and lower the lay 9 and the swivel shuttles 11 thereon, according to whether a single shed for one set of shuttles, as shown in Fig. 4, or a double or split shed for both sets of shuttles, as shown in Fig. 2, is desired, in the usual and well known way. There are in this instance twelve harnesses, 17, for the warp threads 18, see Fig. 2, which are connected at their upper edges with the upright arms of twelve angle or bell crank harness levers or jacks 8, pivotally mounted on a stationary part of the frame, through cords 19, leading over guide sheaves 20 on the loom arches 2, and the sheaves 21 on the stand 22, to small pulleys 23 on chains 24. Each chain 24 is attached at one end to, and passes partially around a flat surface on a cone pulley 25, and passes over a small pulley 23, and is connected at its other end by a link 26, with a notch 8' in the upright arm of a harness lever 8. Only four sets of connections to the harnesses are shown in the drawings. The cone pulley 25 has in this instance twelve peripheral flat surfaces there-



on, one for each chain 24 connected with a harness lever, and is fast on a rock shaft 27, mounted in suitable bearings 28' on stands 28 secured to the loom arches 2, see Fig. 4. 5 Fast on the shaft 27 is the hub 29' of an arm 29, which carries a stud 30 secured thereto, and which in this instance has connected therewith the inner ends of four vibrator connectors 31, see Fig. 4. Through the move- 10 ment of the vibrator connectors 31, movement is communicated to the arm 29, and to the rock shaft 27, and the cone pulley 25 fast thereon, to rotate said cone pulley in one direction or the other, and through the 15 chains 24 secured thereto and to the harness levers, raise and lower the harnesses to form the single and double sheds, as desired.

Fast on the end of the rock shaft 27 is the hub 32' of an arm 32, which arm is connected, 20 through a bar or connector 33, with an arm 34 fast on a rock shaft 35 mounted in bearings 36 on stands or brackets 37 and 38, secured to the loom frame. Fast on the rock shaft 35 is a second cone pulley 39, having 25 in this instance twelve peripheral flat surfaces thereon, one for each chain 40 which passes partially around and is connected at one end to said cone pulley 39, and passes over a small pulley 41, and is connected at 30 its other end, through a link 42, with a notch 8' in the lower arm of a harness lever 8. To each small pulley 41 is connected the end of a harness cord 43, which passes over a guide sheave 44, and a second guide sheave 45, 35 see Fig. 1, to the lower edge of a harness 17.

The rotation of the cone pulley 25, in either direction, will, through the shaft 27, arm 29, connector 33, arm 34, and shaft 35, 40 cause the rotation of the cone pulley 39 in the same direction, and the consequent winding and unwinding of the chains 40 thereon, to cause, in connection with the chains 24 on the cone pulley 25, and the movement of the harness levers 8, the raising and lowering of 45 the harnesses 17, to form the sheds for the swivel shuttles, as desired. It will be understood that the combined movement of the harness levers 8 and the cone pulleys 25 and 39, will form the single sheds, and the 50 double or split sheds, and allow the usual raising and lowering of the harnesses for the single shed, or the double shed position.

In said Fig. 6 is shown a detached portion of a woven fabric, as a suspender web, in- 55 tended to be manufactured by our improvements in shedding mechanism shown in the drawings, and above described. In said Fig. 6; 46 are the warp threads, and 47 the filling threads. In the upper part of the figure 60 is shown the fabric in one piece, formed by the single shed shown in Fig. 4, with one shuttle, while in the lower part of said figure

is shown the fabric in two separate pieces, which are formed by the double or split shed shown in Fig. 2, with two shuttles. Instead 65 of two pieces of fabric shown in the lower part of Fig. 6, separated from each other, the two pieces of fabric may be attached or made in one piece, forming a button-hole.

The operation of our improvements will 70 be readily understood by those skilled in the art, and briefly is as follows:—Through the rotary movement of the vibrator gear 7, by the upper and lower cylinder gears 4 and 5, in the usual way, and through the vibrator 75 connectors 31, movement is communicated to the arm 29, and to the rock shaft 27, and the cone pulley 25 fast thereon, to rotate said cone pulley in one direction or the other, and through the chains or connectors 24, 80 having one end secured thereto, and passing around the pulleys 23 and attached to the harness levers 8 at their other end, and through the cords 19 attached to the pulleys 23 and passing over guide pulleys 21 and 20 85 to the upper edges of the harnesses 17, the harnesses are raised. Through the cords 43 attached to the lower edges of the harnesses 17, and passing over guide sheaves 45 and 44 and attached to the pulleys 41, around which 90 the cords 40 pass, said cords having one end attached to the harness levers 8, and the other end attached to the cone pulley 39, the harnesses 17 are lowered. The raising and lowering of the harnesses form the single and 95 double sheds, as desired.

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

We prefer to use two cones, but in light 100 fabrics the lower cone may be dispensed with, and springs used to draw the harnesses down.

Having thus described our invention, what we claim as new and desire to secure 105 by Letters Patent is:—

In the shedding mechanism of a loom of the class described, the combination with the harness jacks, and the harnesses, of two cone pulleys, one located intermediate the 110 harness jacks and the upper edges of the harnesses, and the other located intermediate the harness jacks and the lower edges of the harnesses, and connections, attached at one end to said cone pulleys, and passing over small 115 pulleys, and connected to the harness jacks, and connections from said small pulleys to the harnesses.

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