

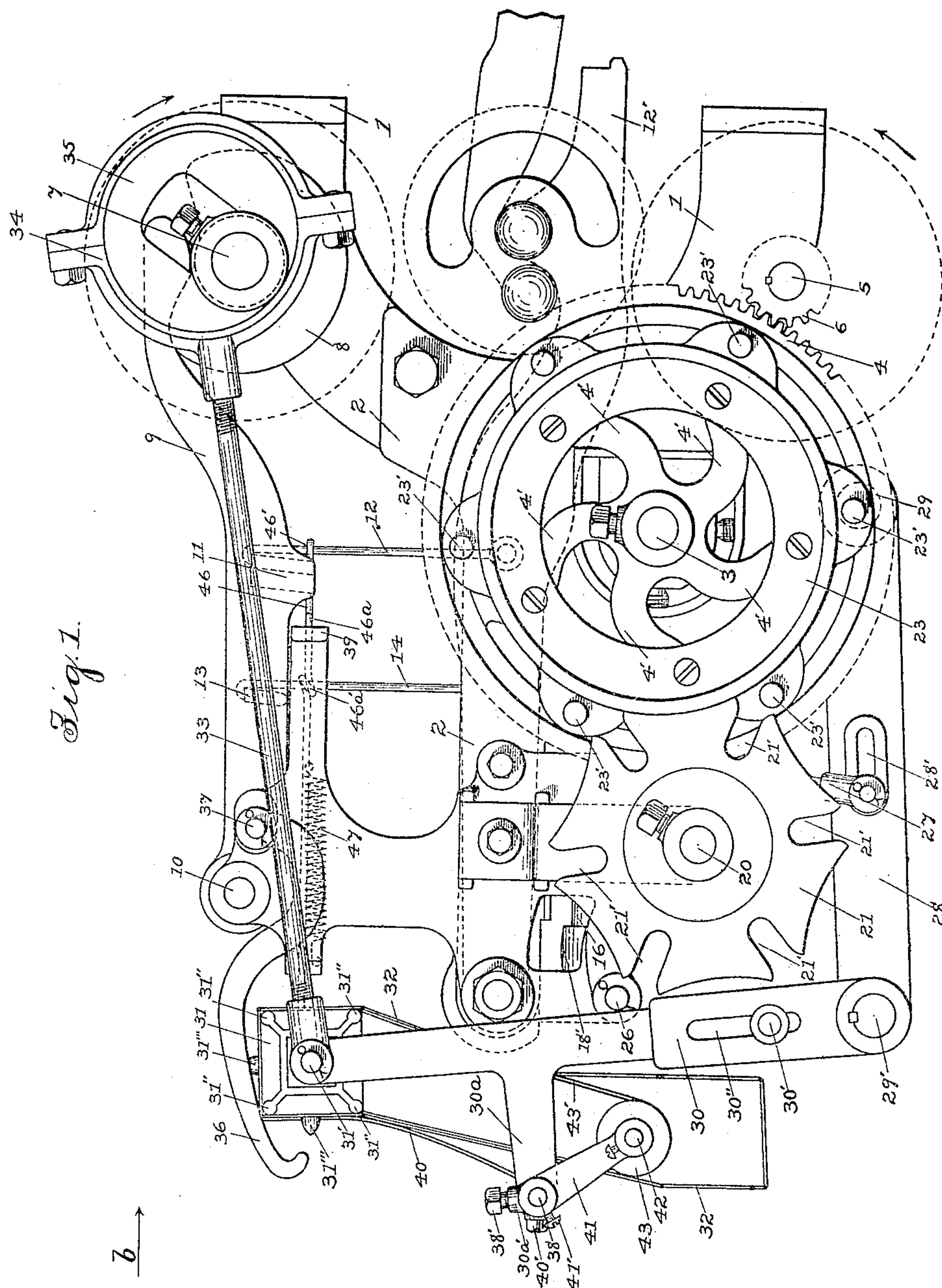
No. 805,756.

PATENTED NOV. 28, 1905.

E. H. RYON.  
PATTERN MECHANISM FOR LOOMS.

APPLICATION FILED JULY 23, 1904.

3 SHEETS—SHEET 1.



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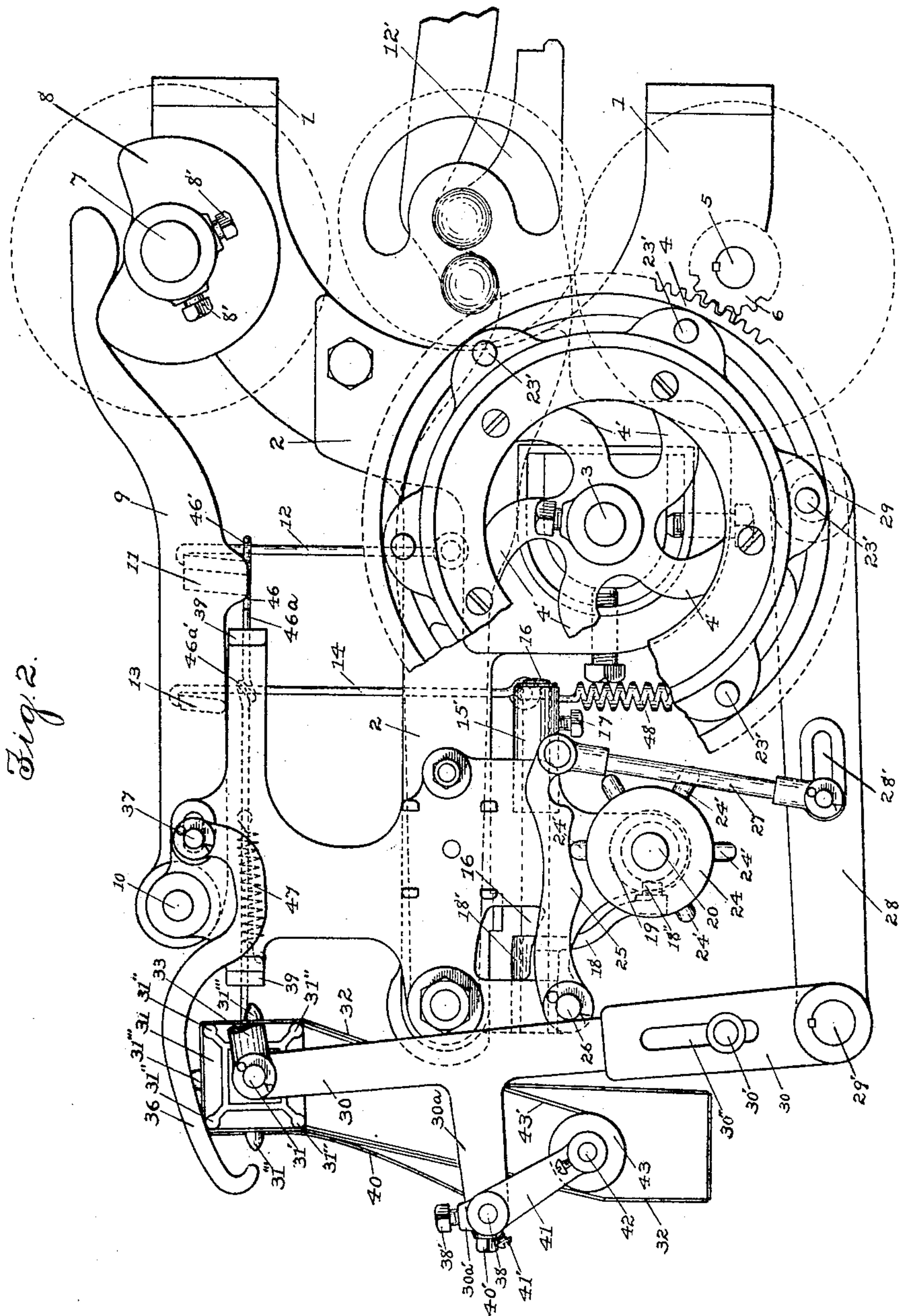
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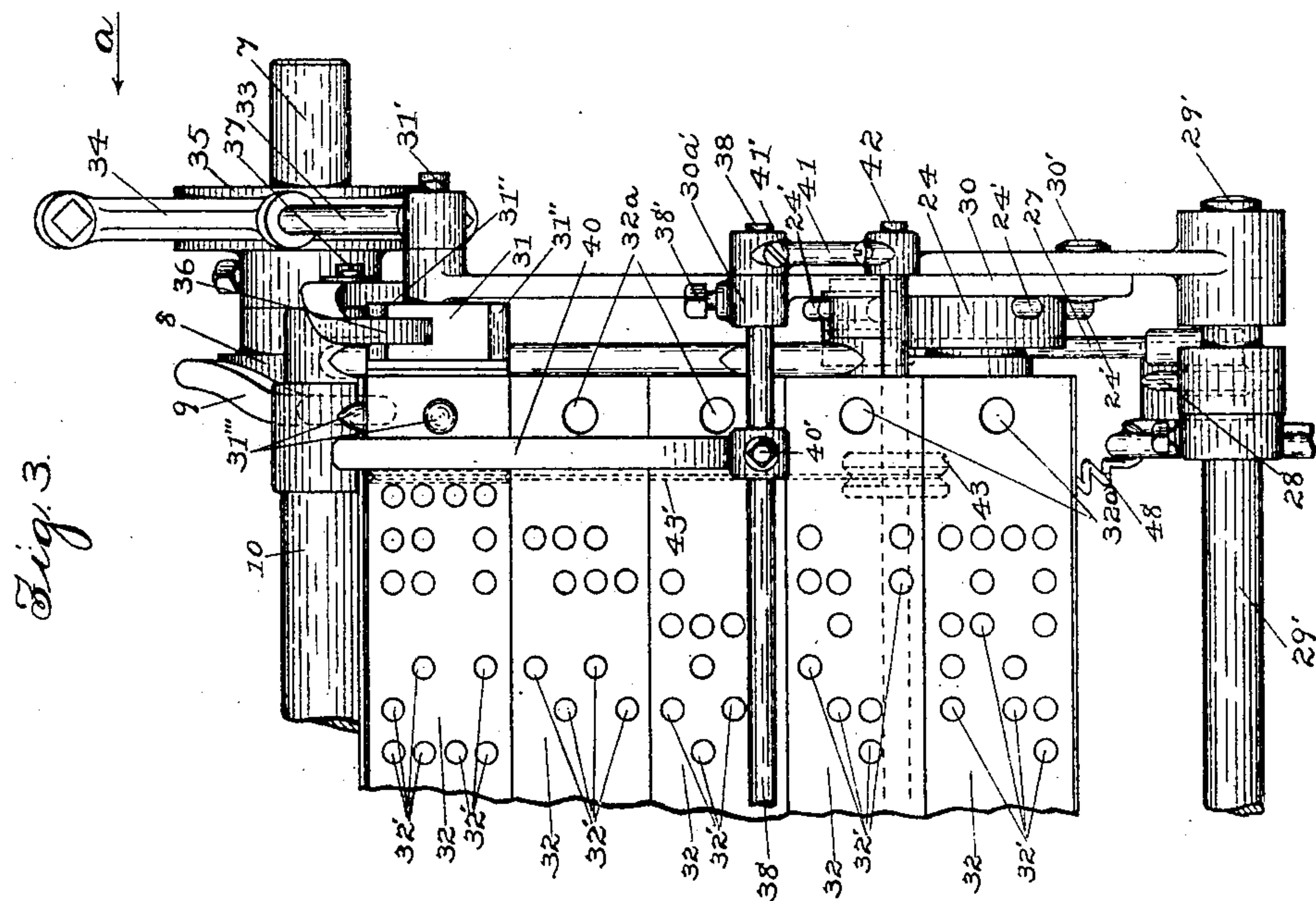
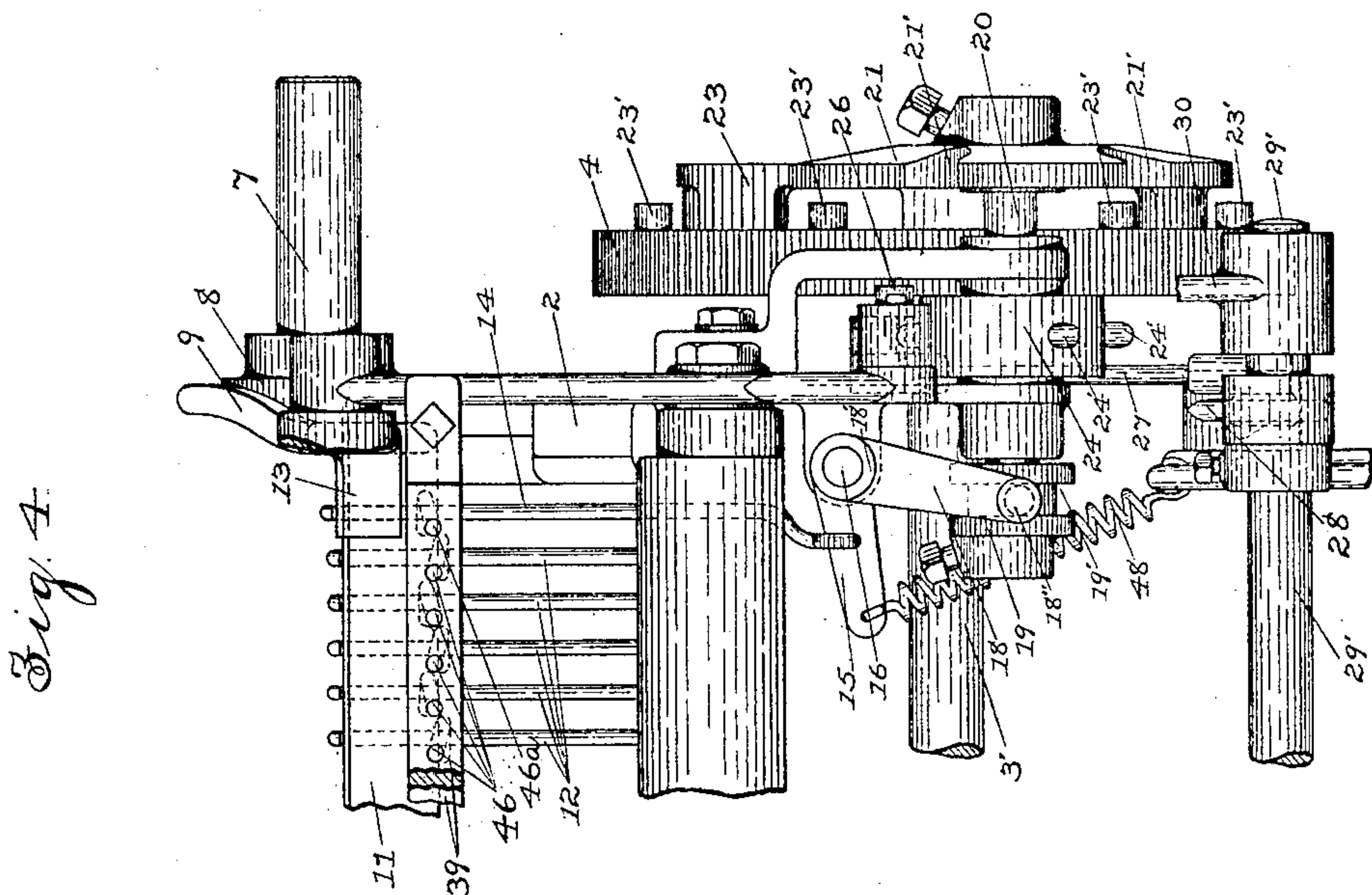


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# PATTERN MECHANISM FOR LOOMS.

APPLICATION FILED JULY 23, 1904.

3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

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## PATTERN MECHANISM FOR LOOMS.

No. 805,756.

Specification of Letters Patent.

Patented Nov. 28, 1905.

Application filed July 23, 1904. Serial No. 217,831.

*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 Pattern Mechanism for Looms, of which the following is a specification.

My invention relates to improvements in looms, and more particularly to improvements in the pattern mechanism of looms and to that class of pattern mechanisms in which a long heavy pattern-chain is required for a long pattern or a pattern with two or more different weaves.

The object of my invention is to improve upon the pattern mechanisms referred to and more particularly to do away with the long heavy pattern-chain ordinarily required for long patterns or patterns with different weaves and to substitute a pattern-chain composed of light cards and also to provide means for operating said pattern-chain to produce a long pattern or two or more different weaves.

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

I have only shown in the drawings portions of a pattern mechanism detached for a four-weave motion embodying my improvements sufficient to enable those skilled in the art to which my invention belongs to understand the construction and operation thereof.

Referring to the drawings, Figure 1 is a front view of a detached portion of a loom-head with my improvements applied thereto looking in the direction of arrow *a*, Fig. 3. Fig. 2 corresponds to Fig. 1; but some of the parts shown in Fig. 1 are removed and others broken away to show the other parts more clearly. Fig. 3 is an end view of the parts shown in Fig. 1 looking in the direction of arrow *b*, same figure; and Fig. 4 corresponds to Fig. 3; but some of the parts shown in Fig. 3 are removed and other parts are shown to more clearly illustrate my improvements.

In the accompanying drawings, 1 is the arch-bracket. 2 is a stand bolted thereto and on which the several parts of the mechanism are supported. The harness-pattern-chain shaft 3 is mounted in bearings on the stand 2 and has fast thereon a gear 4.

5 is the lower-cylinder gear-shaft having

fast thereon a pinion 6, which meshes with the pattern-chain gear 4.

7 is the upper-cylinder gear-shaft.

The upper and lower cylinder gears, vibrator-levers, vibrator-gears, and the vibrator-connector to the harness-jacks are of the ordinary and well-known construction and operation in what is ordinarily termed the "Knowles head-motion" and are shown by broken lines and full lines in Figs. 1 and 2.

Fast on the upper-cylinder gear-shaft 7 is a cam 8, adjustably secured thereon, in this instance by two set-screws 8'. (See Fig. 2.) The cam 8 is engaged by and operates a cam-lever 9, pivoted on a shaft 10. The cam-lever 9 carries one end of a griff 11. The other end of the griff 11 is carried by a lever (not shown) on the back side of the head-motion corresponding to the lever 9. The griff 11 is adapted to engage and raise the hook-wires 12, connected with the vibrator-levers 12'. The cam-lever 9 has also on its inner side a projecting plate or knife 13, adapted to engage the upper end of a hook-wire 14, which is connected at its lower end to a lever 15. (See Fig. 4.) The lever 15 has a hub 15', secured on a rock-shaft 16 by a set-screw 17. (See Fig. 2.)

Fast on the outer end of the rock-shaft 16 is the hub 18' of a shipper lever or arm 18, (see Figs. 2 and 4,) which has at its outer end a stud or roll 18'', adapted to extend into an annular recess 19' in a collar 19, fast on the inner end of the sliding star-wheel shaft 20. On the outer end of the star-wheel shaft 20 is a star-wheel 21, having in this instance six slots 21' in its periphery, adapted to be engaged by the pins 23' on the pin-wheel 23, secured in this instance to the arms 4' of the chain-shaft gear 4. Also fast on the star-wheel shaft 20 is in this instance a barrel or cylinder 24, having pins 24' of different length extending out therefrom (see Figs. 2 and 4) and forming a pattern-surface. The pins 24' are adapted to engage the under surface of a lever 25, pivoted at one end on a stud 26 and connected at its other end, through a connector 27, with a slotted opening 28' in the lever 28. The lever 28 is pivoted at one end on a stud 29 (see Fig. 1) and carries at its other end one end of a rock-shaft 29', on which is fast the lower end of an arm 30, in this instance made in two parts adjustably connected. The upper end of the arm 30 has mounted therein the extended journal or



end 31' on the card-cylinder head 31 of the card-cylinder, which cylinder supports the pattern-cards 32 in the ordinary way. The pattern-cards 32 are in this instance punched with four rows of holes 32' for a four-weave motion; but said cards may have less than four rows of holes, if desired. On the card-cylinder journal 31' is also pivoted one end of a rod 33. (See Fig. 1.) The other end of the rod 33 is attached to an eccentric-strap 34 on the eccentric 35, which is fast on the end of the cylinder-shaft 7. (See Fig. 1.) The rotation of the shaft 7, through eccentric 35, strap 34, and rod 33, communicates a swinging motion to the upright arm 30 and a corresponding upright arm at the back side of the head-motion (not shown) and also a swinging or reciprocating out-and-in motion to the card-cylinder and the cards 32 thereon in the ordinary way. A pawl 36, pivoted on a stud 37, in this instance catches over the projecting pins 31'' on the cylinder-head 31 as the cylinder is moved outwardly and acts to turn or rotate the cylinder in the ordinary way and cause the cards 32 to rotate therewith, said cards having holes 32<sup>a</sup> at their ends, which engage pins 31''' at the ends of the card-cylinder in the usual way.

The upright arm 30 is preferably made in two parts, as shown, to give an adjustment by means of a bolt 30' on the upper part extending through a slot 30'' in the lower part. (See Fig. 3.) Extending outwardly from the upper part of the lever 30 is an extension or arm 30<sup>a</sup>, having a bearing 30<sup>a'</sup>, which supports one end of a rod 38, secured thereon by a set-screw 38'. The rod 38 extends horizontally in front of the card-chain 32 (see Fig. 3) and is supported at its other end. (Not shown.) The lower end of a flat spring 40 is secured to the rod 38 by a set-screw 40' (see Fig. 3) and bears against the pattern-cards 32 to keep them in place on the card-cylinder as it revolves. On the end of the rod 38 is secured by a screw 41' the upper end of an arm 41. The lower end of the arm 41 carries one end of a rod 42, on which is mounted a roll 43, (see Fig. 1,) around which passes a cord 43'. Said cord also passes around the card-cylinder under the cards 32 and acts to strip the cards off the cylinder as it revolves.

The indications of the pattern-cards 32 are communicated through the horizontally-moving indicator-needles 46, which extend through and are supported in holes through bars 39, which extend transversely through the head-motion. The indicator-needles 46 have eyes 46' therein, through which extend the hooks 12. The outer indicator-needle 46<sup>a</sup> is shorter and has an eye 46<sup>a'</sup> therein, through which extends the hook 14. The indicator-needles 46 are actuated by spiral springs in the ordinary way, and a spiral spring 47 actuates the needle 46<sup>a</sup>.

A spiral spring 48 is attached at one end to

the arm 15, to which the lower end of the wire hook 14 is attached, and said spring is attached at its other end to a stationary part of the frame. The spring 48 acts to rock the shaft 16 and, through arm 18 and collar 19, move the shaft 20 longitudinally and hold the star-wheel 21 out of line with the pins 23' on the pin-wheel 23, as shown in Fig. 4.

From the above description, in connection with the drawings, the operation of my improvements will be readily understood by those skilled in the art and briefly is as follows: The upper and lower cylinder gear-shafts 7 and 5 make a revolution at each pick of the loom, while the harness-pattern chain-shaft gear 4 and pin-wheel 23 thereon make but one-sixth of a revolution at each revolution of the cylinder gear-shafts. The eccentric 35 on the upper-cylinder gear-shaft being connected, through strap 34 and rod 33, with the pattern-card cylinder moves said card-cylinder toward and away from the indicator-needles 46, which move hook-wires 12 according to the indications of the pattern-cards 32 or allow them to hook over the griff 11 and be lifted into a raised position as the cam 8 acts upon the cam-lever 9 and raises it to its highest position. The raising of the hook-wires 12 raises the vibrator-levers 12', to which they are attached, and also the vibrator-gears, to be acted on by the upper-cylinder gear in the usual way, and the lowering of the hook-wires 12 lowers the vibrator-levers 12' and also the vibrator-gears, to be acted on by the lower-cylinder gear. When it is time for the weave of the pattern to be changed, the pattern-card 32, having holes through it for such indication, comes into proper position to allow the indicator-needle 46<sup>a</sup>, which is connected with the hook-wire 14, to be acted upon by the spiral spring 47 and cause said hook-wire 14 to hook over and engage the lift-plate 13 and be raised by the upward movement of the cam-lever 9 when raised by the revolution of the cam 8. The upward movement of the hook-wire 14, through arm 15, rocks the shaft 16, and through arm 18, engaging the collar 19, moves the shaft 20, carrying the star-wheel 21, so that the star-wheel 21 will be in alignment with and adapted to be engaged by the pins 23' on the pin-wheel 23. A pin 23' on the pin-wheel 23, engaging a slot 21' in the star-wheel 21, communicates a rotary motion to the star-wheel 21, the shaft 20, and the cylinder 24, carrying the pins 24', causing the pin 24' in engagement with the lever 25 to move out of engagement with said lever and another pin, either shorter or longer, to come under and engage said lever 25 and cause said lever to be moved into a higher position or to drop into a lower position and through connector 27 raise or lower the lever 28, and the upright lever 30, carrying the pattern-card cylinder, to raise or lower the pattern-card cylinder and bring another set of openings in the pat-



tern-cards 32 in line with the indicator-needles 46 and the needle 46<sup>a</sup>.

It will be understood that the pattern-cards 32 may have four rows of holes 32' therein, as shown, or less than four rows of holes and that the corresponding rows of holes on each card make up one pattern or a certain weave, and through the automatic raising or lowering of the card-cylinder, as above described, by means of the pins 24' on the cylinder 24 or equivalent pattern mechanism engaging the lever 25, the proper position will be automatically given to any one of the rows of holes in the pattern-cards 32 for the indications of said holes on the indicator-needles 46 and the needle 46<sup>a</sup>. It will thus be seen that a very long pattern may be made from light-weight pattern-cards and that as each row of holes on the pattern-cards may be of a different pattern or weave a number of different patterns or weaves may be obtained and the automatic change from one weave to another is easily accomplished.

It will be understood that the details of construction of my improvements may be varied, if desired. A flexible pattern-chain may be substituted for the cylinder 24 with the pattern-pins 24', if preferred.

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

1. In a pattern mechanism of a loom, the combination with a rotary pattern-cylinder, indicator-needles, hooks controlled by said needles, and vibrator-levers, of means for moving said pattern-cylinder to change the plane thereof relatively to the engaging ends of the indicator-needles, said means, comprising a rotary pattern-surface having pattern indicators or projections thereon of different length, substantially as shown and described.

2. In a pattern mechanism of a loom, the combination with a rotary pattern-cylinder, indicator-needles, hooks controlled by said needles, and vibrator-levers, of means for moving said pattern-cylinder to change the plane thereof relative to the engaging ends of the indicator-needles, said means comprising a rotary pattern-surface having pattern indicators or projections thereon of different length, and connections intermediate said pattern-surface and said rotary pattern-cylinder, substantially as shown and described.

3. In a pattern mechanism of a loom, the combination with a rotary pattern-cylinder, indicator-needles, hooks controlled by said needles, and vibrator-levers, of means for moving said pattern-cylinder to change the plane thereof relative to the engaging ends of

the indicator-needles, said means comprising a rotary pattern-surface having pattern indicators or projections thereon of different length, and a pin-wheel and star-wheel mechanism for operating said rotary pattern-surface, substantially as shown and described.

4. In the pattern mechanism of a loom, a rotary pattern-card cylinder, pattern-cards thereon, means for rotating said cylinder, longitudinally-moving indicator-needles operated by said pattern-cards, and connected with hook-wires, and said hook-wires connected with vibrator-levers, and said vibrator-levers, and means for raising said hook-wires, of a supplemental longitudinally-moving indicator-needle operated by said pattern-cards, a hook-wire connected with said supplemental indicator-needle, means for engaging said hook-wire and raising it at predetermined intervals, connections intermediate said hook-wire and a rotary pattern-surface, and means to rotate said pattern-surface, and said pattern-surface, and connections intermediate the same and said pattern-card cylinder, to raise and lower said cylinder, and bring the pattern-cards thereon in position to operate the indicator-needles, according to the indications of said pattern-surface, substantially as shown and described.

5. In a pattern mechanism of a loom, the combination with the upper and lower cylinder gears, vibrator-gears, vibrator-levers, hook-wires connected to said levers, longitudinally-moving indicator-needles connected to said hook-wires, means for raising said hook-wires, a rotary pattern-card cylinder carrying pattern-cards for operating the indicator-needles, and means for rotating said pattern-card cylinder, of a supplemental longitudinally-moving indicator-needle operated by said pattern-cards, a hook-wire connected therewith, means for raising said hook-wire, connections intermediate said hook-wire and a rotary pattern-surface, and means for rotating said pattern-surface at predetermined intervals, and said pattern-surface, and connections intermediate the same and the rotary pattern-card cylinder, to raise and lower said cylinder according to the indications of said rotary pattern-surface, to cause the longitudinally-moving indicator-needles to be operated, according to the different patterns on the pattern-cards, substantially as shown and described.

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