

(No Model.)

3 Sheets—Sheet 1.

W. WATTIE.
PATTERN MECHANISM FOR LOOMS.

No. 501,700.

Patented July 18, 1893.

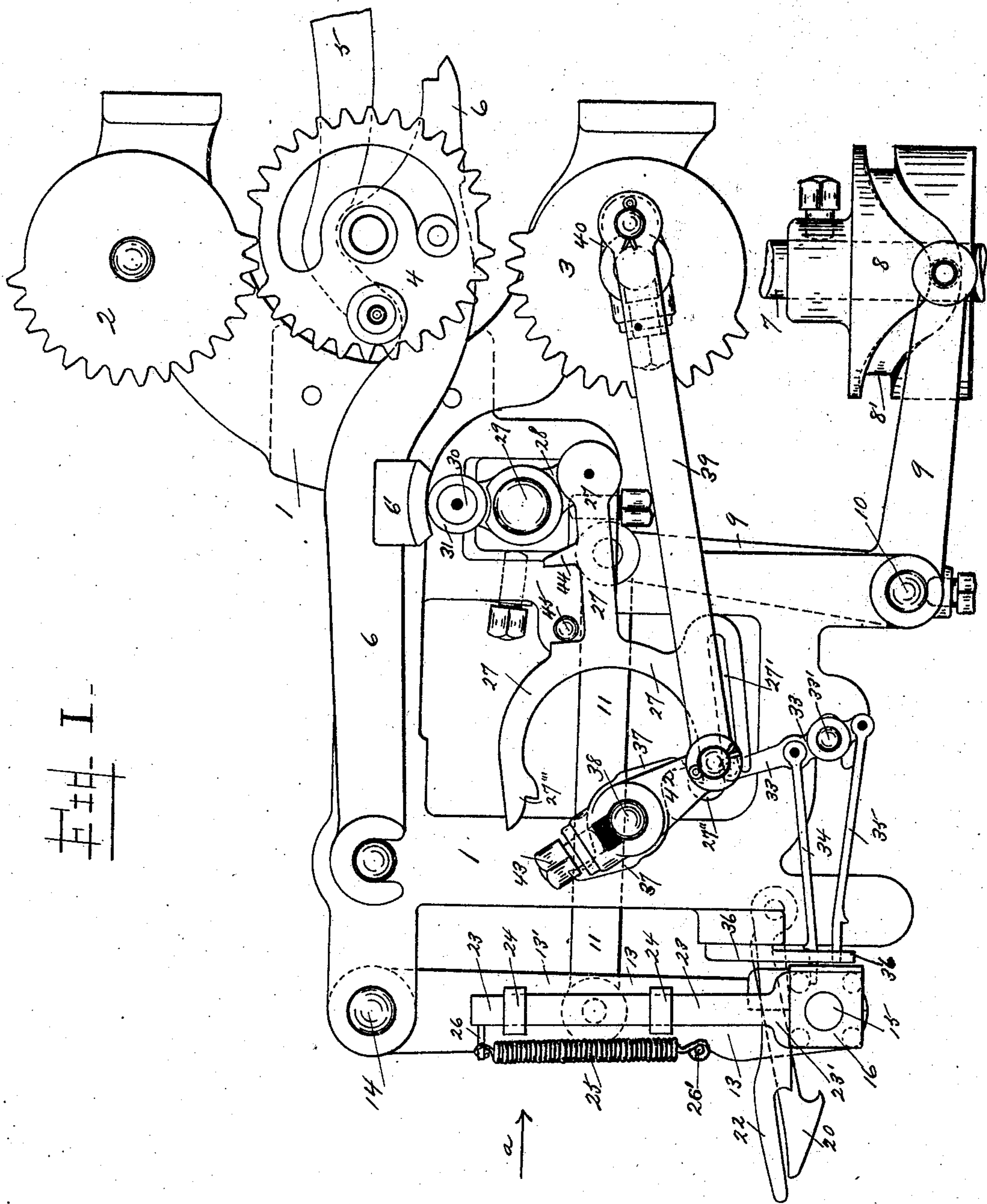


Fig. 1

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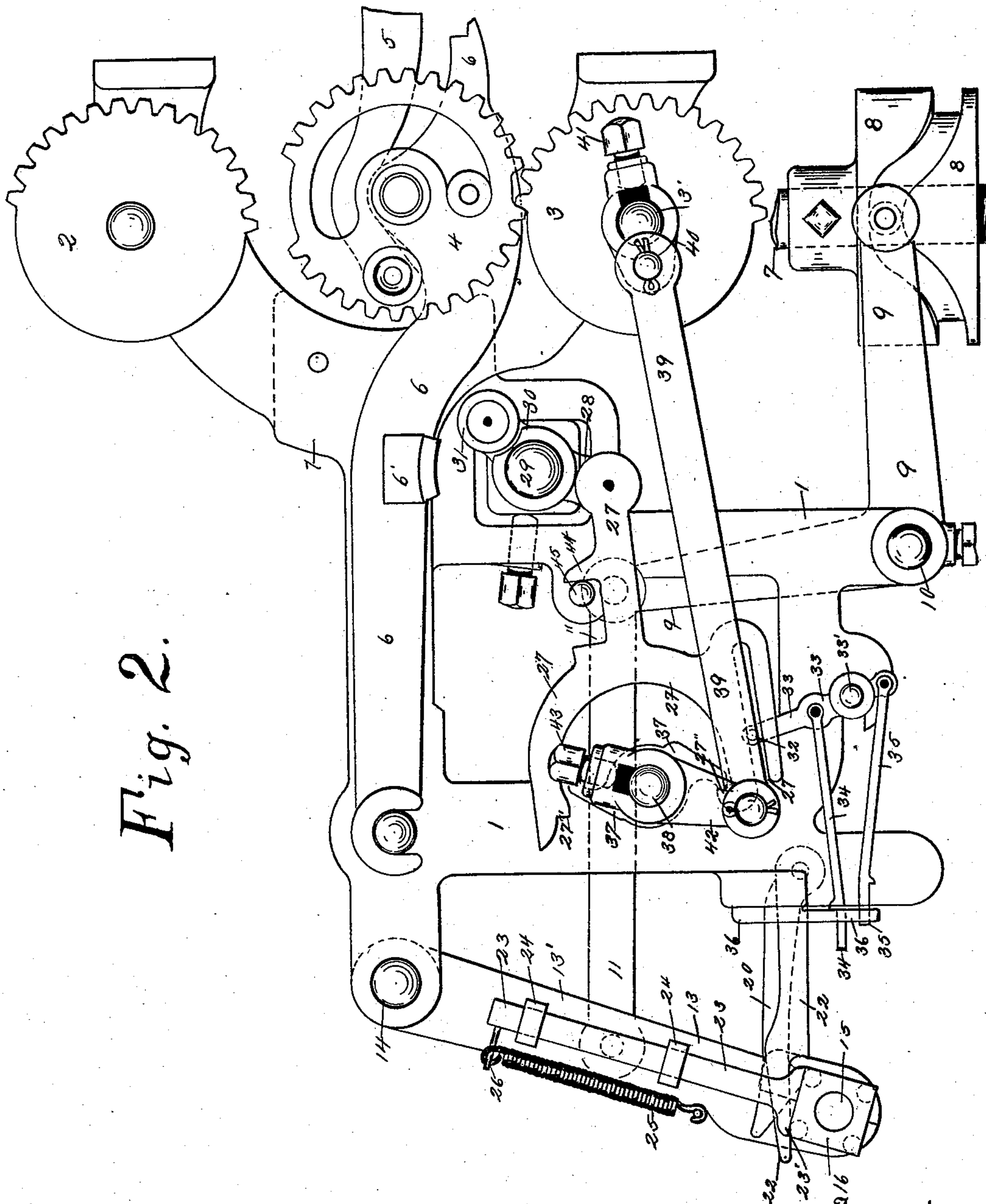


Fig. 2.

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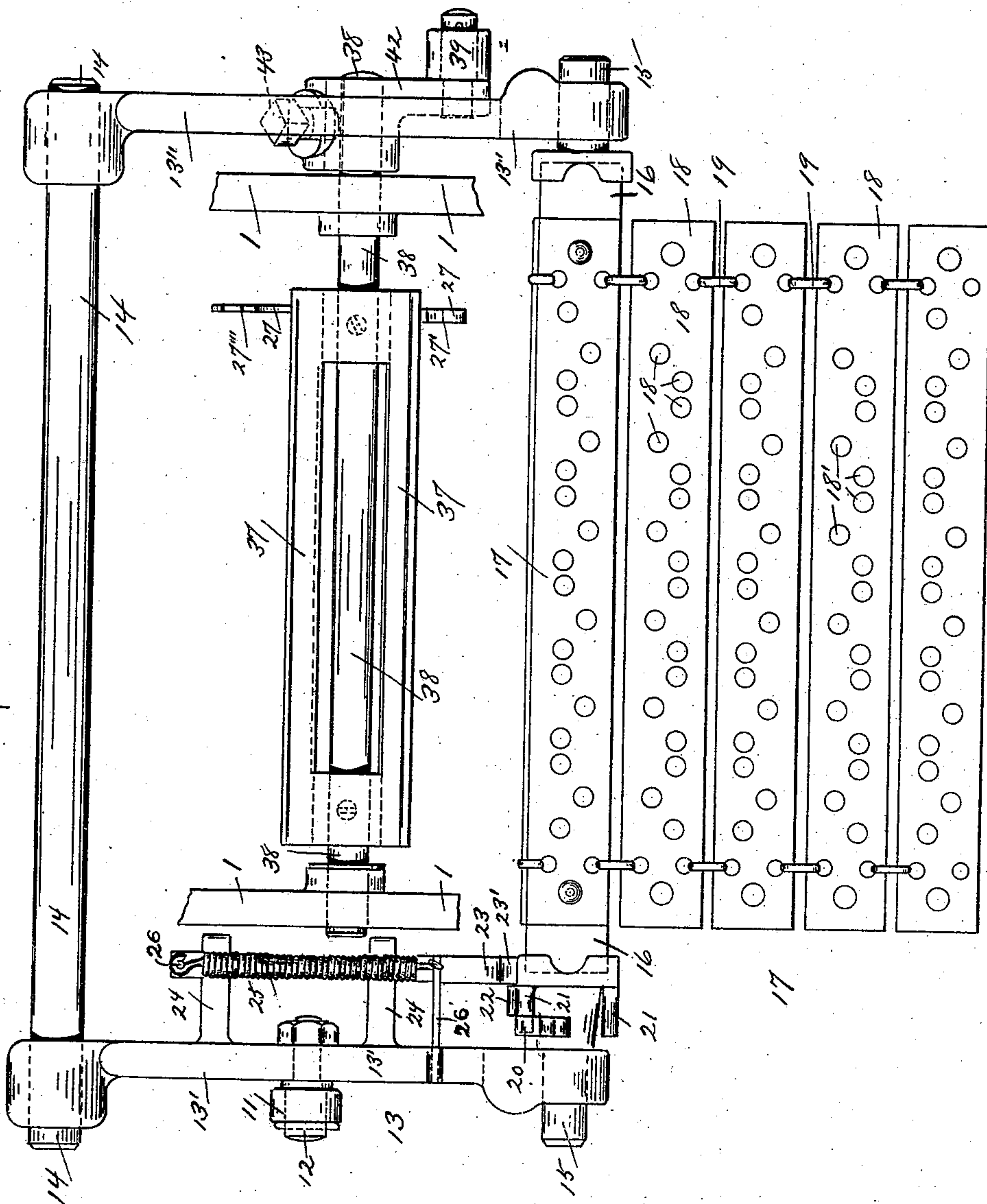
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Fig. 3.



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UNITED STATES PATENT OFFICE.

WILLIAM WATTIE, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE
KNOWLES LOOM WORKS, OF SAME PLACE.

PATTERN MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 501,700, dated July 18, 1893.

Application filed February 6, 1893. Serial No. 461,076. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM WATTIE, 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; and I do hereby declare that the following is a full, clear, and exact description thereof, which, in connection with the drawings making a part of this specification, will enable others skilled in the art to which my invention belongs to make and use the same.

My invention relates to looms, and more particularly to that class of looms known as the "Knowles" loom, such loom being shown and described in the Reissue Letters Patent No. 7,784, of July 3, 1877.

In many cases it is desirable to dispense with the use of the ordinary metal tube and roll pattern chain, which are expensive to make and bulky, and in complicated patterns must be very long, and require considerable room, and to substitute a light pattern chain, which is inexpensive to make and occupies but little room.

The object of my invention is to provide a supplemental mechanism adapted to be combined with the ordinary head motion of the Knowles loom, above referred to, in which a paper pattern chain is substituted for the ordinary metal pattern chain, without materially altering the construction, or changing the operation of the ordinary Knowles head motion.

My invention consists in certain novel features of construction and operation of the supplemental mechanism above referred to, combined with the ordinary head motion of the Knowles loom, as will be hereinafter fully described, and the nature thereof indicated by the claims.

Referring to the drawings:—Figure 1 is a side view of sufficient portions of the head motion of the Knowles loom, above referred to, with my improvements applied thereto, to illustrate the nature of my invention, showing one position of the operative parts with the swinging pattern chain frame in its inward position, and the vibrator gear in engagement with the upper cylinder gear; the front side

of the head frame, and of the swinging pattern chain frame is removed for the sake of clearness. Fig. 2 corresponds to Fig. 1, but shows the swinging pattern chain frame in its outward position, and the vibrator gear in engagement with the lower cylinder gear. Fig. 3 is an end view of the swinging pattern chain frame, and other parts, looking in the direction of arrow *a*, Fig. 2; some of the parts are left off for the sake of clearness.

In the accompanying drawings, 1 is the head frame, in which are supported the several operative parts.

2 and 3 are the upper and lower cylinder gears, 4 the vibrator gear, 5 the vibrator lever, and 6 the indicator lever, all of the usual construction and operation in the Knowles loom referred to.

7 is the upright shaft for driving, through beveled gears not shown, the upper and lower cylinder gears 2 and 3, in the usual way.

I will now proceed to describe my improvements combined with the several parts of the head motion above described. Upon the upright shaft 7 is fast a cam 8 having a cam groove 8' in the periphery thereof, in which is adapted to travel a roll mounted on a pin in one end of the angle lever 9. The angle lever 9 is pivoted on a stud 10, fast in the lower part of the frame 1, at the rear of said frame, as shown in Figs. 1 and 2. To the opposite end of the angle lever 9 from that which is operated on by the cam 8, is pivoted one end of an arm or connector 11. The other end of said connector 11 is attached to a pin 12, secured to the side 13' of the swinging frame 13, see Fig. 3. Said frame 13 consists of two arms 13' and 13'', (the front arm 13'' is not shown in Figs. 1 and 2,) which arms are pivotally supported at their upper ends on a shaft 14 mounted in the frame 1.

In the lower ends of the arms 13' and 13'', of the swinging frame 13, are loosely mounted the chucks 15, carrying the pattern chain cylinder 16, upon which is supported the pattern chain 17, made up of strips of card board or other material 18, provided with perforations 18' therein, and attached together by loops 19, or otherwise, in the ordinary way. Through the cam 8, angle lever 9, and connector 11, a positive swinging motion is com-

communicated to the frame 13, and to the pattern cylinder 16, mounted in the lower end of said frame. A rotary motion is communicated to the pattern chain cylinder 16, to cause the pattern chain 17 to revolve and the different perforated strips forming said chain to be presented to the operating needles, by the hook 20, pivoted at its inner end on the frame, and adapted to engage with its outer hooked end pins 21, extending out from the four corners of one end of the pattern chain cylinder 16, to pull over said pattern chain cylinder, as the swinging frame is moved outwardly, in the usual way. A notched arm 22 is pivoted at its inner end on the frame, contiguous to the hook 20, and preferably between said hook 20 and the end of the pattern chain cylinder 16, and in case of the stopping of the loom, or for any other cause, there is only a partial rotation of the pattern cylinder by the hook 20 on the outward movement of the swinging pattern frame, said arm 22 will engage one of the pins 21 on the end of the pattern chain cylinder 16, on the inward movement of the swinging frame, so as to return said cylinder to its normal position, with one of the flat sides thereof toward the needles 34 and 35, as shown in Fig. 1. A sliding rod 23, provided with an enlarged lower end or foot 23', adapted to bear on the plane sides of the pattern chain cylinder 16, is supported and adapted to move longitudinally in bearings 24 upon the inner side of one of the arms of the swinging frame 13, in this instance the rear arm 13'. A spring 25 attached at one end to a pin 26' extending out from the arm 13' and at the other end to a pin 26 extending out from the upper end of the rod 23, tends to move downwardly said rod 23, and to cause the same to press on the pattern chain cylinder 16, to hold the same and prevent it from turning, except when it is operated upon by the hook 20, or arm 22.

The indicating mechanism, for communicating to the ordinary indicator levers 6, the indications of the pattern chain, consists of a series of forked levers 27, one for each indicator lever (only one forked lever 27 is shown in the drawings); said lever is pivoted at its inner end on the lower end of the double lever or arm 28, loose on a rock shaft 29, supported in bearings in the frame; said rock shaft 29 is substituted for the shaft of the ordinary pattern chain cylinder. The upper end 30 of the double lever or arm 28, carries a roll 31, adapted to engage the foot 6' of the indicator lever 6. The lower arm of the forked lever 27 is provided with a longitudinal slot 27' therein, in which travels a pin 32, on the upper end of the lever 33, pivoted on a shaft 33', supported in the frame 1. Needles 34 and 35 are pivoted at their inner ends on the lever 33, upon opposite sides of its pivot point, and the outer free ends of said needles are supported in the bracket 36 secured to the frame 1; the extreme ends of said needles 34 and 35 are acted on by the pattern

surface, and when the unperforated portion of the pattern surface is presented to the end of one needle, the other needle will extend through a hole in the pattern surface, and into the corresponding hole made in the pattern cylinder. (See Figs. 1 and 2.) The forked levers 27 are operated to move the indicator levers 6, at the proper time, by the double bladed knife 37, mounted on a rock shaft 38, supported in bearings in the frame 1. A positive motion is communicated to said rock shaft 38, in this instance from the lower cylinder gear 3, by a connector 39, secured at one end to a crank 40, adjustably connected to the shaft 3' of the cylinder gear 3, by a set screw 41, see Fig. 1, and secured at its outer end to a crank 42, adjustably secured by a set screw 43 to the rock shaft 38, see Fig. 3. As the double bladed knife 37 is rocked back and forth, the knives thereon will engage the hook 27'' upon the lower arm of the hooked lever 27, or the notch 27''' on the upper arm of the forked lever 27, according as said lever is raised into its highest position, or drawn down into its lowest position, by the movement of the lever 33 carrying the pin 32 traveling in the slot 27' in the forked lever 27, and operated by the needle 34 or 35. When the lower blade of the knife 37 engages with the lower hooked end 27'' of the forked lever 27, it draws outwardly said lever until the lug 44 strikes against the stop rod 45 supported in the frame 1, and moves the roll 31 on the double lever 28 away from the foot 6' on the indicator lever 6, and allows the indicator lever to drop, carrying the vibrator gear 4 into contact with the lower cylinder gear 3, to communicate through the vibrator lever 5 the desired movement to the harness or drop box, as shown in Fig. 2. When the upper blade of the double bladed knife 37 engages the notch 27''' in the upper arm of the forked lever 27, it moves said lever backward until it strikes against the stop rod 45, and causes the roll 31 to be moved under the foot 6' on the indicator lever, and raises said indicator lever so that the vibrator gear 4 will engage with the upper cylinder gear 2, as shown in Fig. 1. After the forked lever 27 has been moved forwardly or backwardly, and operated the indicator lever, as above described, it remains in that position until one of the needles 34 or 35 is again operated by the pattern surface, to move the lever 33, and raise or lower the forked lever 27, and cause the same to be engaged by the double bladed knife 37.

From the above description in connection with the drawings, the operation of the indicating mechanism operated by the pattern surface, will be readily understood by those skilled in the art. It will be observed that a positive motion is communicated to the rocking double bladed knife 37, and said double bladed knife 37 will operate the forked lever 27, to cause the same to operate the indicator lever 6, to raise said lever, or to allow the same to drop, according as the upper notched

arm of the forked lever 27 is engaged by the upper blade of the double bladed knife 37, or the lower hooked arm of the forked lever 27 is engaged by the lower blade of the double bladed knife 37. It will be observed, that when either of the needles 34 or 35 is operated, by the end of the needle coming against the non-perforated part of the pattern chain, a positive up or down motion is communicated to the forked lever 27, through the pin 32 on the pivoted lever 33 traveling in the slot 27' in the lower arm of said forked lever 27, and said lever will be engaged by the upper or lower blade of the double bladed knife 37, and will be moved backwardly or forwardly, so that a positive motion, at the proper time, will be communicated to the forked lever 27, and through said lever, and the double lever or arm 28, carrying the roll 31, to the indicator lever 6.

In case it is not desired to use the pattern chain mechanism shown in the drawings, the same may be readily removed from the loom, and the ordinary pattern chain shaft substituted for the rock shaft 29, and the pattern chain cylinder and the ordinary metal pattern chain mounted thereon, to act on the indicator levers 6 in the usual way.

It will be understood that the details of construction of some of the parts shown in the drawings may be changed if desired.

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 upper and lower cylinder gears, the vibrator gear, the indicator lever, and the pattern surface supported on a swinging frame, and said frame, and means for swinging said frame, and for rotating the pattern surface or chain, of intermediate mechanism between the in-

dicator lever, and the pattern surface, consisting of a forked lever, provided with a slot and pivoted to a double lever or arm, loose on a rock shaft, and carrying a roll which engages the indicator lever and said double lever or arm, and rock shaft, and a double bladed knife supported on a rock shaft, and adapted to engage and operate said forked lever, and said rock shaft, and means for operating the same, and a pivoted lever, provided with a pin which engages the slot in the forked lever, and the indicating needles pivoted at their inner ends upon said pivoted lever, upon opposite sides of its pivot point, with their free ends adapted to be acted on by the pattern surface, for the purpose stated, substantially as shown and described.

2. In a loom of the class described, the combination with the indicator lever, of means for communicating the indications of the pattern surface to said indicator lever, consisting of a double lever or arm loose on a rock shaft, with one end adapted to engage the indicator lever, and the other end pivoted to one end of a forked lever, and said rock shaft, and forked lever provided with a slot, and a double bladed knife supported on a rock shaft and adapted to engage and operate said forked lever, and said rock shaft, and means for operating the same, and a pivoted lever provided with a pin adapted to travel in the slot in the forked lever, and two indicating needles pivoted at their inner ends upon said pivoted lever, upon opposite sides of its pivot point, with their free ends adapted to be operated on by the pattern surface, for the purpose stated, substantially as set forth.

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Witnesses:

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