

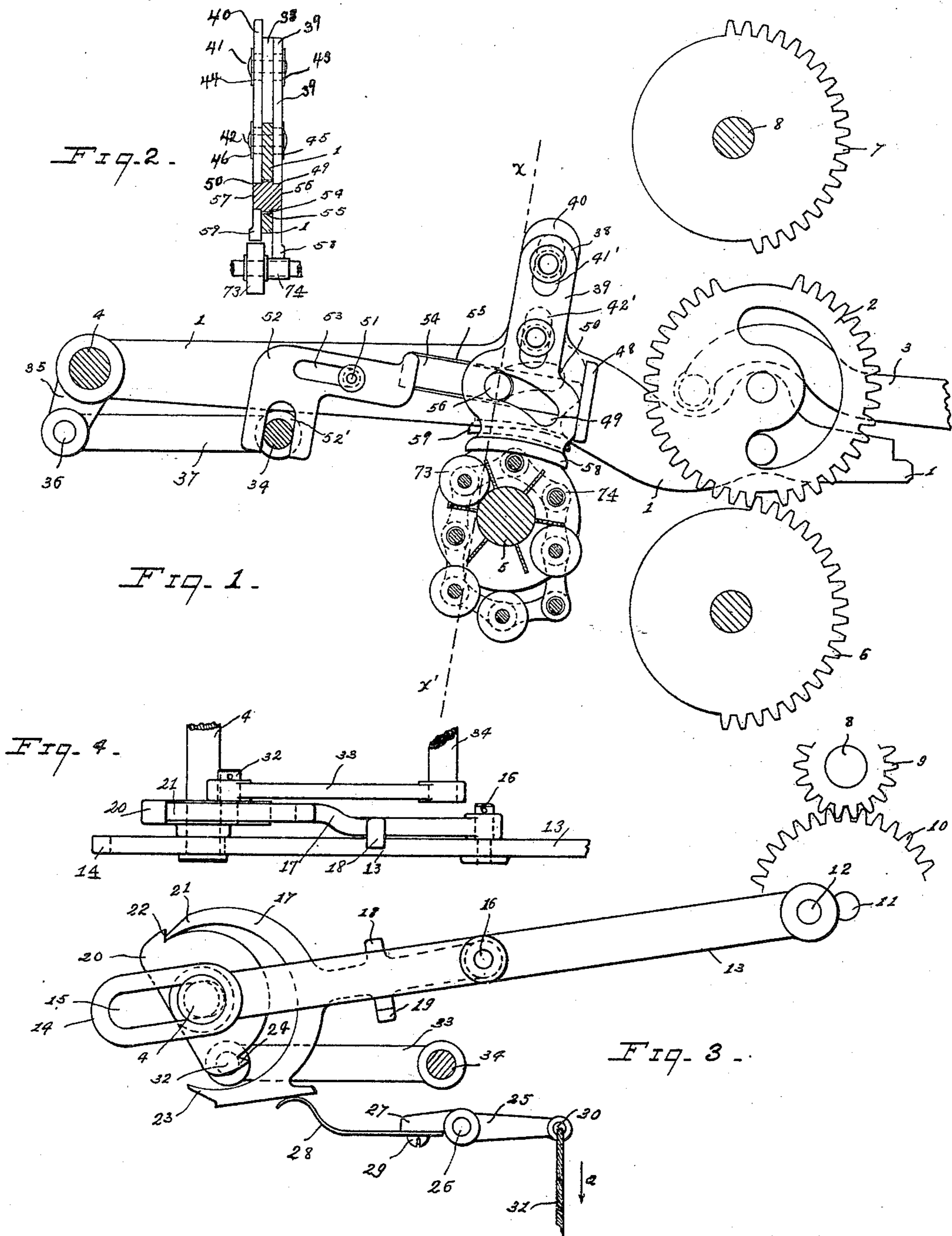
(No Model.)

2 Sheets—Sheet 1.

G. F. HUTCHINS.
HARNESS MOTION FOR LOOMS.

No. 446,553.

Patented Feb. 17, 1891.



Witnesses

Annie L. Grogan
Clinton Howard

Inventor

Geo. F. Hutchins

By his Attorney

John C. Dewey

(No Model.)

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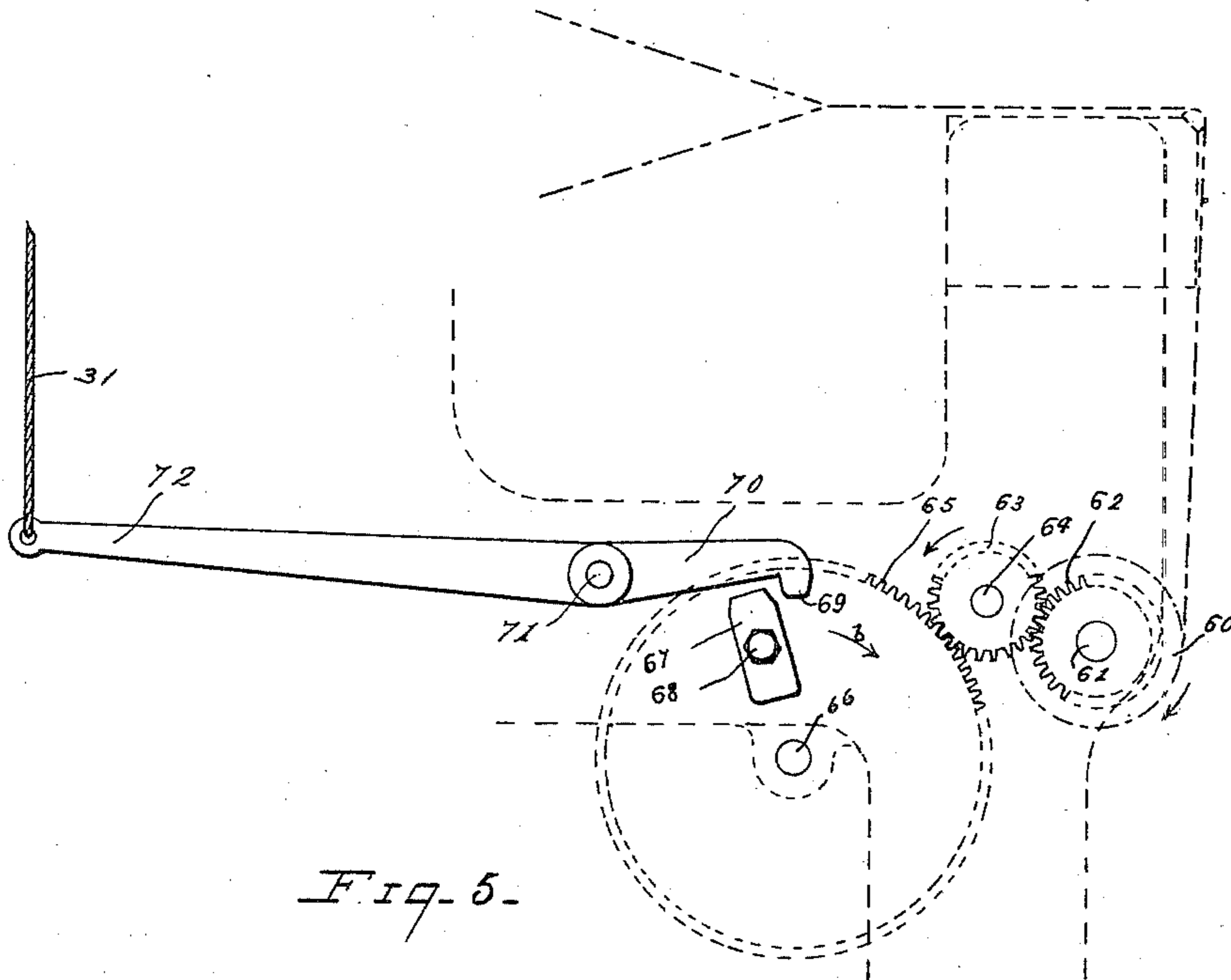


Fig-5-

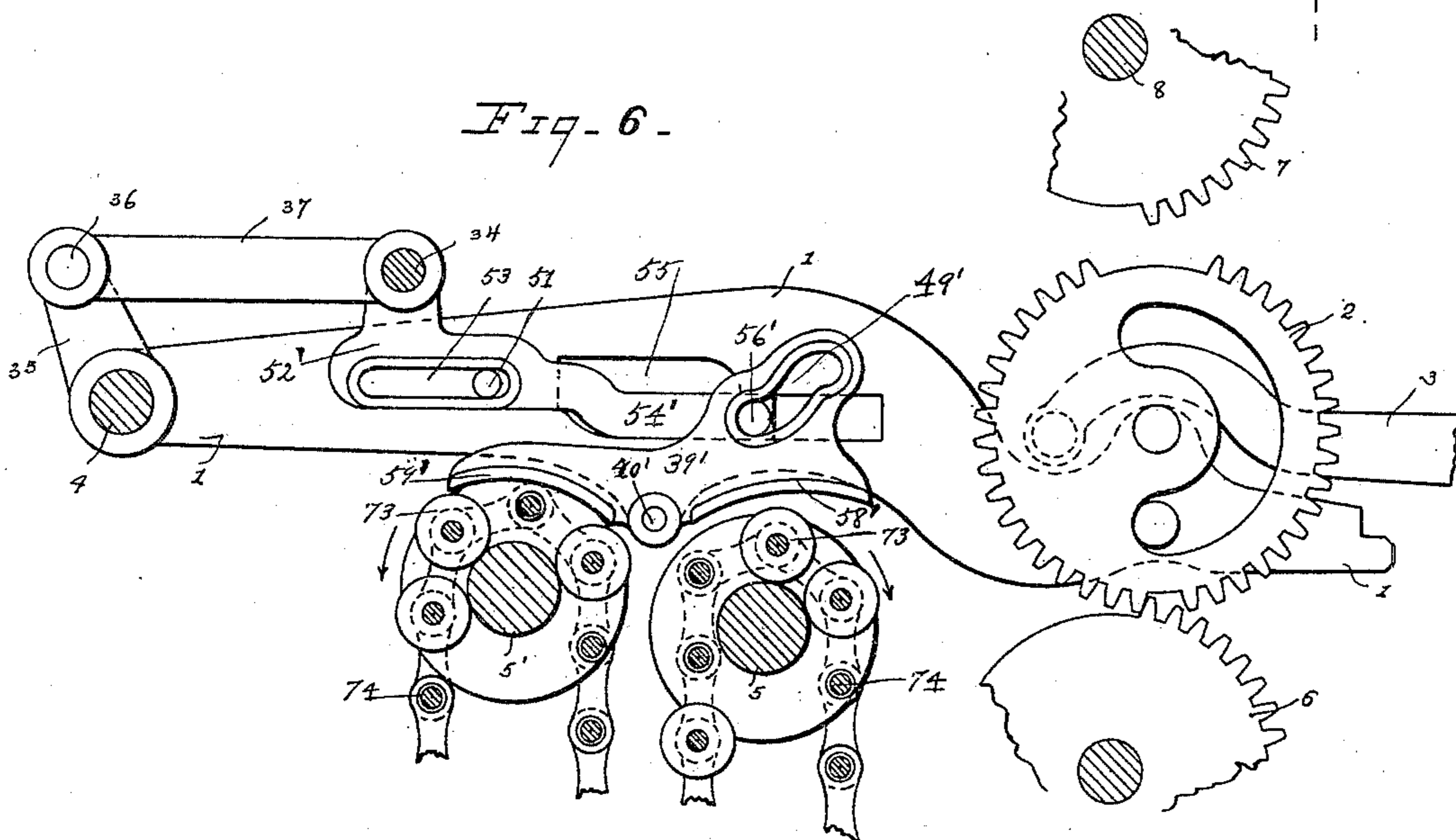


Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE F. HUTCHINS, OF WORCESTER, MASSACHUSETTS, ASSIGNOR TO THE
KNOWLES LOOM WORKS, OF SAME PLACE.

HARNESS-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 446,553, dated February 17, 1891.

Application filed June 19, 1890. Serial No. 355,947. (No model.)

To all whom it may concern:

Be it known that I, GEORGE F. HUTCHINS, 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 Harness-Motions 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 the harness-motion of looms; and the object of my invention is to combine with two sets of pattern indicators or surfaces, either on the same shaft or on different shafts, the vibrators of a harness-motion provided with devices or movable runs supported thereon and operated automatically to engage or be disengaged from their respective pattern set of pattern indicators or surfaces for the purpose of causing the harnesses to be operated to make a class of goods that is composed of two different weaves, more particularly bags having the open body portion and the closed ends.

My invention consists in certain novel features of construction and operation of the mechanism for producing the result above referred to, as will be hereinafter fully described.

Referring to the drawings, Figure 1 represents a side elevation of a portion of the harness-motion set forth in Letters Patent of the United States No. 134,992 with one form of my improvement applied thereto. Fig. 2 is a section on line $x x'$, Fig. 1. Fig. 3 is a side elevation of a portion of my improvement. Fig. 4 is plan view of the parts shown in Fig. 3. Fig. 5 is a side elevation of the indicating mechanism, and Fig. 6 is a view of a modification of my improvement shown in Fig. 1.

In the accompanying drawings, 1 represents the vibrator, 2 the vibrator-gear, 3 the jack-connector, 4 the vibrator-heel pin, 5 the pattern-chain shaft, 6 the lower cylinder-gear, and 7 the upper cylinder-gear, all as usually arranged.

Fast on shaft 8 of cylinder-gear 7 is the gear 9, (see Fig. 3,) which meshes with gear 10, hung loosely on pin 11, fast in a suitable stand. (Not shown.) The gear 10 has twice the number of teeth of gear 9, and as gear 9 revolves once in every pick the gear 10 will revolve once in every two picks. The gear 10 carries a pin 12 at a suitable distance from its center of rotation, and this pin 12 is the crank, which gives a reciprocating motion to the connector 13. Said connector 13 at its end has a slot 15, through which passes the vibrator heel-pin 4. On the pin 16, fast in connector 13, is hung the double pawl 17, which double pawl is provided with two stop-lugs 18 and 19. This double pawl 17 works in the two-tooth ratchet 20, fast on vibrator heel-pin 4. The two teeth of the ratchet 20 are made opposite to each other, and the end 21 of pawl 17 is intended to work in tooth 22, while the end 23 of pawl 17 works in tooth 24. A lever 25 is hung loosely on stud 26, fast in a suitable stand, and to the end 27 of lever 25 is made fast a flat spring 28 by means of the screw 29. The lever 25 is also provided with the eye 30, in which the cord 31 is fastened. The pin 32 is fast in the ratchet 20, and from it runs the connector 33 to the rod 34. (See Figs. 3 and 4.) On the other end of vibrator heel-pin 4 opposite to ratchet 20 is made fast the arm 35, (see Fig. 1,) and from the pin 36, fast in the arm 35, runs the connector 37 to the rod 34. The pin 36 is set the same distance from the center of the vibrator-pin 4 as the pin 32, and is in line with it.

I have shown in the drawings, Fig. 1, one way of carrying out my invention, which I will now proceed to describe. The vibrator-lever 1 is provided with the horn 38 extending up therefrom, and on opposite sides of this horn 38 are secured the movable pieces or runs 39 and 40, in this instance by means of rivets 41 and 42, extending through slots 41' and 42' in said runs, and washers 43, 44, 45, and 46. (See Fig. 2.) The runs 39 and 40 in this instance butt against and are guided by the vertical projections 48 on vibrator-lever 1. (See Fig. 1.) The run 39 has the curved slot 49 and the run 40 has a simi-

lar curved slot 50 therein, said curved slots 49 and 50 inclining in opposite directions. The lower ends of the runs 39 and 40 are enlarged and provided with rims 58 and 59, respectively, which rest on two sets of pattern indicators or surfaces, made up of rolls 73 and tubes 74.

The mechanism for operating the movable runs 39 and 40, which engage the pattern-surfaces, consists in this instance of a slide 52, attached to the vibrator-lever 1 by means of the rivet 51, and provided with the slot 53, through which said rivet 51 extends. The end 54 of slide 52 is bent and extends in the slot or opening 55 in vibrator-lever 1, and is flush on each side with the body of the vibrator-lever 1. At the extreme end of part 54 of slide 52 are two lugs 56 and 57, which project, respectively, into the curved slots 49 and 50 of slides 39 and 40. (See Fig. 2.) The slide 52 is also provided with the open slot 52', into which fits the rod 34. The rod 34 runs in a guide (not shown) to keep it from falling out of place.

60, Fig. 5, is the take-up or sand-roll, (shown in dotted lines,) and is driven in the usual way by any suitable mechanism. (Not shown.) Fast on shaft 61 of sand-roll 60 is the gear 62, which meshes with the intermediate gear 63, hung loosely on stud 64, fast in the loom side. Said gear 63 in turn meshes with gear 65, hung loosely on stud 66. The cam-piece 67 is made fast to gear 65 by the screw 68, and rotates with the gear 65, whose forward motion is indicated by the direction of arrow *b*. In its passage of rotation the cam-piece 67 comes in contact with end 69 of lever 70, which is hung loosely on stud 71, and forces up end 69, which upward motion of end 69 will cause end 72 of lever 70 to move downward.

The mechanism above described is intended to be applied to the harness-motion of looms on which it is desired to produce a certain weave for a certain distance and then to have the weave automatically changed and another style of weave produced a certain distance, and the weave again automatically changed to produce the first style of weave, and so on. A loom provided with my improvement on the harness-motion may be used for weaving any class of goods that is composed of two different weaves; but it is designed more especially for the weaving of bags.

Each vibrator-lever 1 is provided with two movable runs, and each run is adapted to rest upon its respective pattern-surface. In Fig. 1 the two sets of pattern indicators or surfaces of the two runs 39 and 40 are supported on the same shaft. One pattern-surface is built to weave the body of the bags when working on the set of vibrator runs corresponding to 40, and the other pattern-surface is built to weave the bottom of the bags when working on the set of runs corresponding to 39.

In Fig. 2 I show one section of a chain hav-

ing two sets of pattern indicators or surfaces. Two spaces of the section to be occupied by either rolls or tubes, according to the pattern, go to each vibrator-lever.

The operation of the mechanism shown in the drawings is as follows: When the body of the bag is being woven, the mechanism for shifting the runs 39 and 40 on the vibrator-lever is in the position shown in Fig. 3. The slide or connector 13 and the double pawl 17 are driven back and forward once in two picks, the ratchet 20 and rod 34 have been pushed into the position shown, and this position of rod 34 will move the slide 52 forward and reverse the position shown in Fig. 1 of vibrator runs 39 and 40—*i. e.*, bring run 40 down so as to work on the corresponding pattern-surface and force run 39 up, so that the corresponding pattern-surface will not touch it. The pattern-chain is turned by a star-wheel (not shown) in the usual manner, and the length of the body of the bag is woven. The circumference of the sand-roll 60 is known, and consequently every revolution of the sand-roll 60 will measure off a certain amount of goods woven. The gears 62 and 65 can be made of any proportion, and every time the gear 65 rotates the cam-piece 67 will come in contact with the lever 70, causing the end 72 to pull the cord downward, and consequently work the lever 25 and connecting mechanism. The end 69 of lever 70 will remain on the cam-piece 67 until a certain length of material is woven, by which time the cam-piece 67 will move out from under the end 69, releasing said end, which will be carried down into the position shown in Fig. 5 by the weight of the pawls 17 resting on the spring 28, through lever 25 and cord 31, raising the end 72 of the lever 70. The end 69 being released from contact with the cam 67, the cord 31 will also be released and allow the lever 25 and pawl 17 to assume the position shown in Fig. 3. When the lever 70 pulls the cord 31 in the direction of arrow *a*, the flat spring 28 will force the double pawl 17 upward, and when the end 23 engages with the tooth 24 the ratchet 20 and arm 35 will be forced round by the motion of the pawl and bring the rod 34 into the position shown in Fig. 1, and this position of the rod 34 will move the slide 52 and operate the vibrator runs 39 and 40, and move them into the position shown in Fig. 1, and the continued motion of the pattern-chains will change the motion of the harnesses, so as to weave in the bottom of the bag.

The indicating mechanism is made to measure inches and not picks, and it is obvious that the mechanism will not keep exactly in time with the picks of the loom. If the indicating mechanism should pull the cord 31 while the double pawl is in the position shown in Fig. 3, the pawl will move upward until it comes in contact with the ratchet, and then the spring 28 will bend for the rest of the motion; but when the pawl has been

drawn back clear of the tooth of the ratchet by the revolution of gear 10 the spring 28 will force it upward the required distance, and the continued revolution of gear 10 will shift the vibrator-slides. The two lugs 18 and 19 on double pawl 17 strike against the connector 13 and keep the pawl 17 from dropping too far down or being forced too far up by the spring 28.

10 The pattern to weave the bottom of the bags must be such that it will "make up" on the length of pattern-surface for the body of the bag—that is, in the two sets of pattern indicators or surfaces one must be a certain multiple of the other. The gear 10 is timed to shift the vibrator at such a time as not to interfere with the working of the other parts of the loom.

I have so far described one way of carrying out my invention; but it will be understood that any other equivalent way may be employed and that the shape and manner of attachment of the two movable runs to each vibrator-lever may be varied from what is shown and described, and the mechanism for automatically operating the movable runs may be changed, if desired, and instead of having the two sets of pattern indicators or surfaces on one shaft they may be arranged on two shafts, one back of the other, if preferred, as illustrated in Fig. 6.

In Fig. 6 I have shown a modified form of my improvement shown in Fig. 1. In said Fig. 6 I employ two separate pattern chains or surfaces mounted on separate pattern-chain shafts 5 and 5', properly geared together and placed one back of the other. Instead of employing two movable slides, as shown in Fig. 1, I provide a movable piece 39', pivoted at 40' on the lower part of the indicator 1, and provided with two runs or rims 58' and 59', located on opposite sides of the pivot-point and adapted to engage the two pattern-chains respectively. The movable piece 39' has a slot 49' therein, through which extends a pin 56' on the part 54' of the slide 52', which is operated in a similar manner to the slide 52, shown in Fig. 1.

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

1. In the harness-motion of a loom, the combination, with a vibrator-lever carrying movable runs supported thereon for engaging alternately two sets of pattern indicators or surfaces, of means for operating said runs to cause them to engage their respective pattern-surfaces at the proper time, substantially as set forth.

2. In the harness-motion of a loom, the combination, with the cylinder-gears, the vibrator-gear, and two pattern surfaces, of a vibrator-lever, two movable surfaces or runs on said lever adapted to engage alternately their respective pattern-surfaces at the proper time, and means for operating said runs to cause

them to engage with or be disengaged from the pattern-surfaces, substantially as set forth.

3. In the harness-motion of a loom, the combination, with the upper and lower cylinder-gears, the vibrator-gear, and two pattern-surfaces, of a vibrator-lever provided with movable surfaces or runs, said surfaces adapted to engage alternately said pattern-surfaces at the proper time, for the purpose stated, substantially as set forth.

4. In the harness-motion of a loom, the combination, with cylinder-gears, the vibrator-gear, the vibrator-lever, and the pattern-surfaces, of movable runs or surfaces supported on the vibrator-lever and adapted to engage alternately their respective pattern-surfaces at the proper time, and means for operating said runs to cause them to be engaged with or be disengaged from the pattern-surfaces, for the purpose stated, substantially as set forth.

5. In the harness-motion of a loom, the combination, with the vibrator-lever, the pattern-surfaces, and movable runs supported on said vibrator-lever and adapted to engage alternately their respective pattern-surfaces at the proper time, of means for operating said runs, consisting of a slide, intermediate connections to the vibrator heel-pin, the vibrator heel-pin, and mechanism connected with the vibrator heel-pin to cause the same to have a rocking motion and to move the slide in one direction or the other to move the runs on the vibrator-lever, substantially as set forth.

6. In a loom, the combination, with the pattern-surfaces and a vibrator-lever carrying movable runs thereon, adapted to engage alternately their respective pattern-surfaces at the proper time, of the indicating mechanism and intermediate connections between said indicating mechanism and movable runs on the vibrator-lever for operating said runs, substantially as set forth.

7. In the harness-motion of a loom, the combination, with the vibrator-gear, the cylinder-gears, a pinion on a shaft of one of said gears, a gear meshing with said pinion, a connector leading from a crank-pin on said gear and carrying a double pawl pivoted thereon, a spring engaging said pawl carried on a lever, and said lever and means for operating said lever, of a ratchet supported on the vibrator heel-pin, and said vibrator heel-pin, a connector leading from said ratchet to a rod or bar, and said rod or bar, a second connector leading from a radial arm on the vibrator heel-pin to said rod or bar, and said radial arm, and a slide connected with said rod or bar and carried on a vibrator-lever, said slide connected with and adapted to operate the movable runs on said vibrator-lever, and said vibrator-lever and movable runs, substantially as set forth.

8. In the harness-motion of a loom, the combination, with a vibrator-lever, movable runs

supported thereon, and a slide connected with
said runs and with a rod or bar, and said rod
or bar, a connector leading from said rod or
bar to a radial arm on the vibrator heel-pin,
5 and said radial arm, and vibrator heel-pin, a
second connector leading from said rod or bar
to a ratchet on said vibrator heel-pin, and said
ratchet, of a connector carrying a double pawl
thereon for engaging the ratchet on the vi-
brator heel-pin, and means for operating said ro
connector, substantially as set forth.

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