

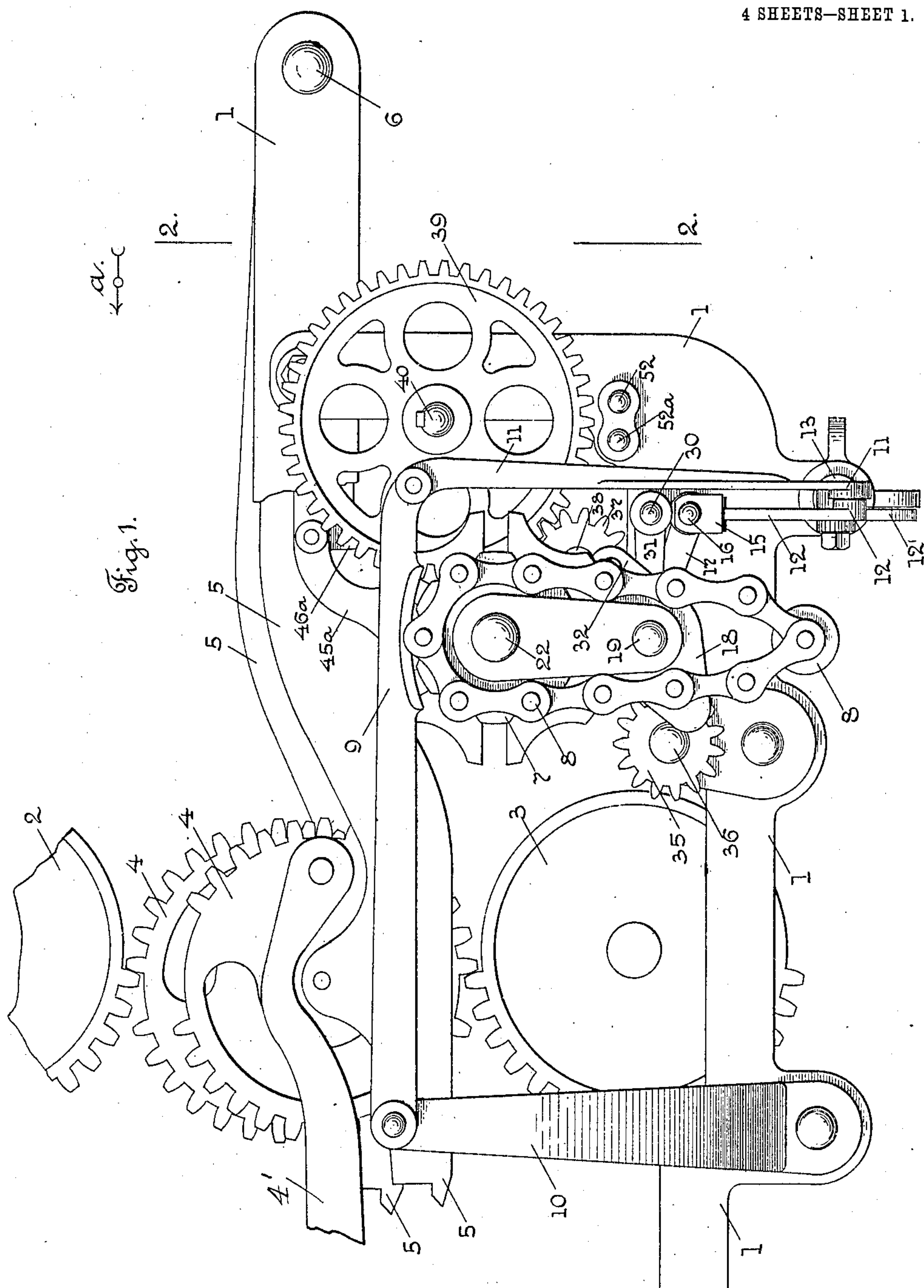
No. 844,736.

PATENTED FEB. 19, 1907.

B. F. McGUINNESS.  
PATTERN MECHANISM FOR LOOMS.

APPLICATION FILED MAR. 31, 1906.

4 SHEETS—SHEET 1.



Witnesses  
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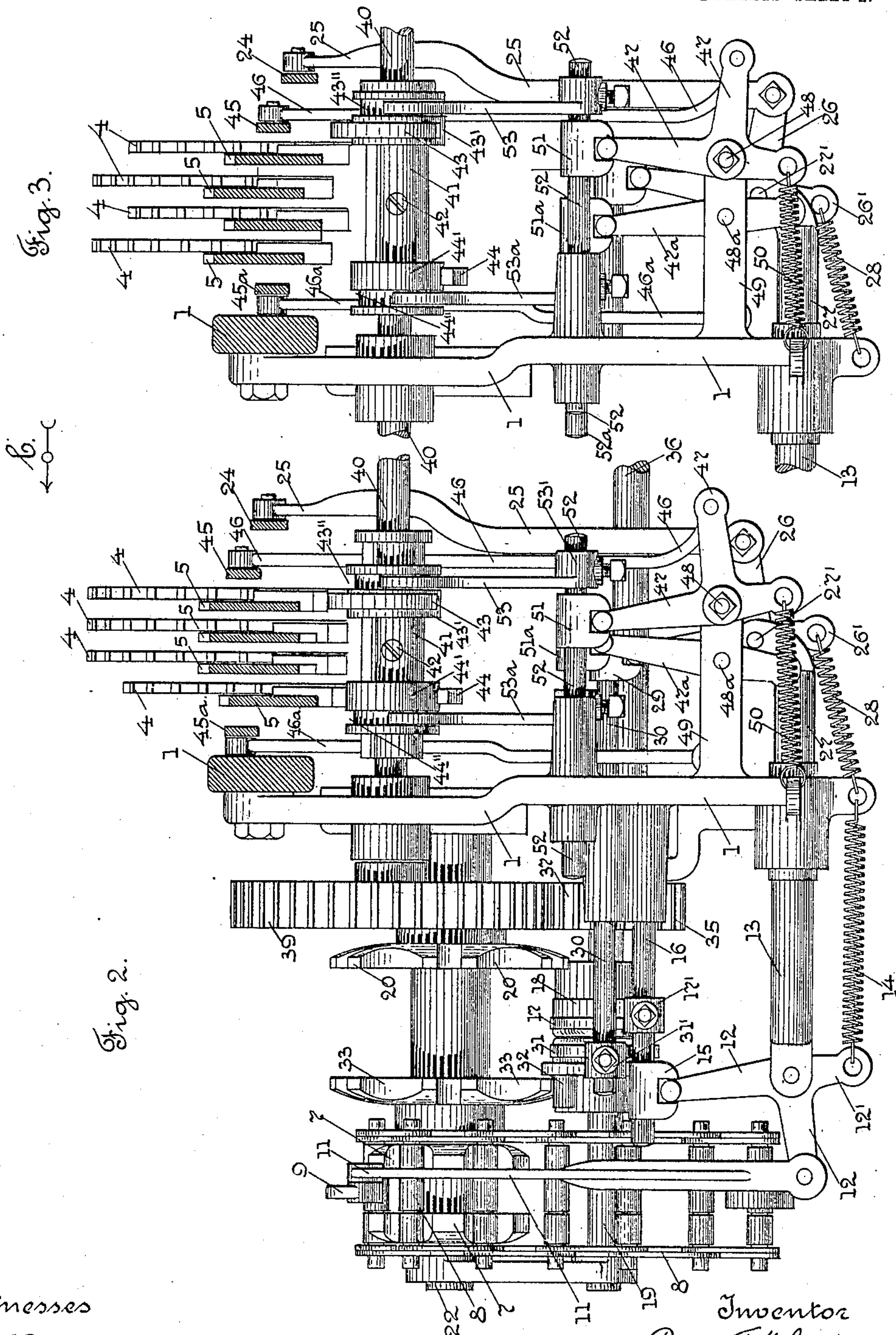
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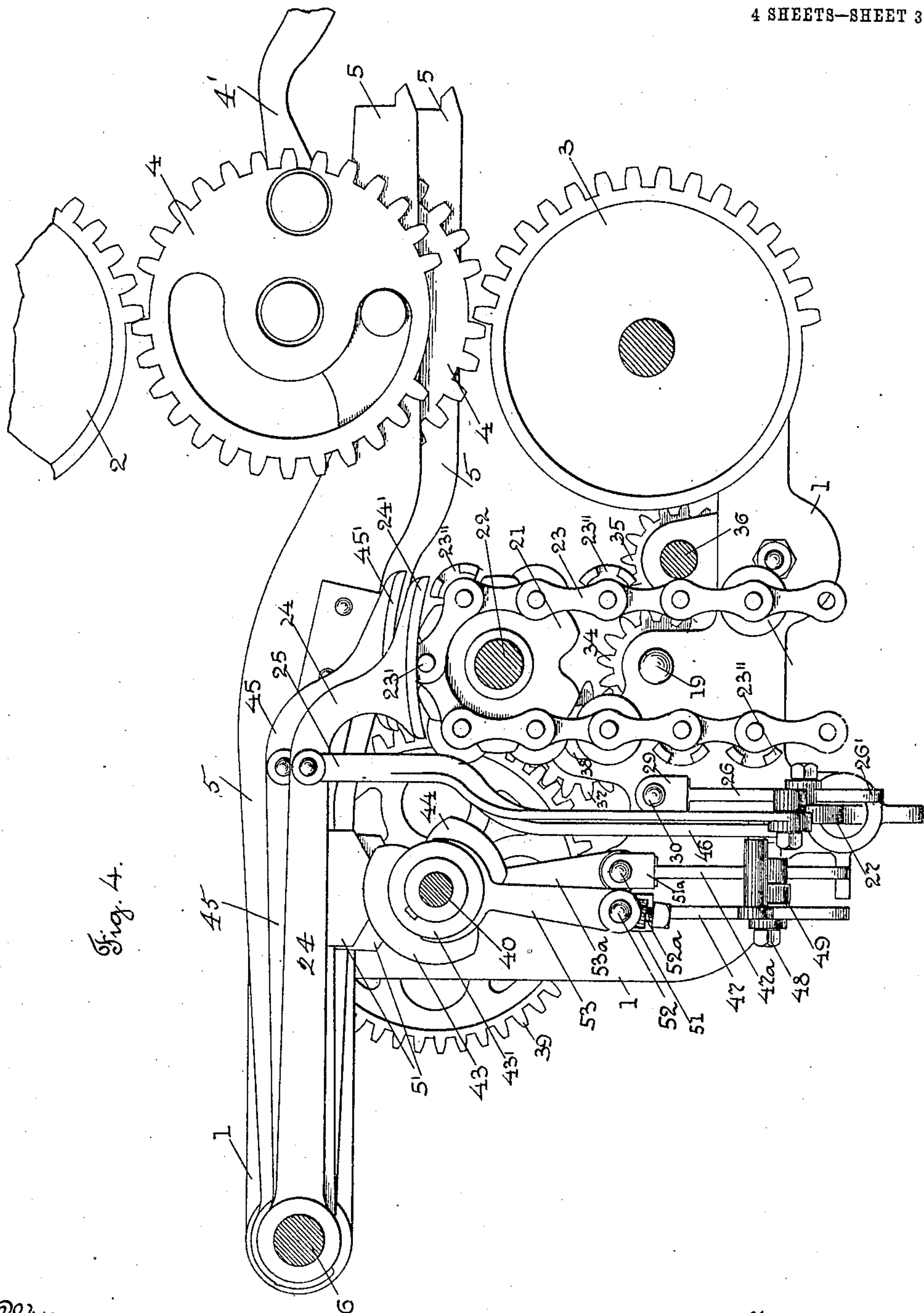


Fig. 4.

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# UNITED STATES PATENT OFFICE.

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TO CROMPTON & KNOWLES LOOM WORKS, A CORPORATION OF MASSACHUSETTS.

## PATTERN MECHANISM FOR LOOMS.

No. 844,736.

Specification of Letters Patent.

Patented Feb. 19, 1907.

Application filed March 31, 1906. Serial No. 309,113.

*To all whom it may concern:*

Be it known that I, BENJAMIN F. McGUINNESS, 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 a pattern mechanism for looms; and the object of my invention is to provide a pattern mechanism of improved construction particularly adapted to be used on looms for weaving plaids, &c., having change or shifting shuttle-boxes at each end of the loom, by means of which a single pick from two or more shuttles for a number of repeats may be obtained with one bar of chain.

In my improvements I provide rotatable cams adapted to be moved under the vibrator-levers of the shuttle-box pattern-chain according to the indications of said chain, which cams act to operate said vibrator-levers for a predetermined time, leaving the box pattern-chain at rest, and are then moved out of operative position to allow the box pattern-chain to operate the vibrator-levers in the usual way.

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 a detached portion of the well-known Knowles head-motion of a loom and a multiplier mechanism with my improvements combined therewith sufficient to enable those skilled in the art to understand the construction and operation thereof.

Referring to the drawings, Figure 1 is a front view of a pattern mechanism embodying my improvements and showing the lower cylinder-gear, the vibrator-gear, the vibrator-lever, and a portion of the upper cylinder-gear of the well-known Knowles head-motion. Fig. 2 is a section on line 2 2, Fig. 1, looking in the direction of arrow *a*, same figure. Fig. 3 shows the parts shown at the right in Fig. 2 in a different position. Fig. 4 is an end view of the parts shown in Fig. 2 looking in the direction of arrow *b*, same figure. Some additional parts are shown in this figure which are not shown in Fig. 2. Fig. 5 shows the parts shown at the left in Fig. 4. Some of the parts shown in

Fig. 4 are not shown in this figure. Fig. 6 is a section on line 6 6, Fig. 5, looking in the direction of arrow *c*, same figure.

In the drawings are shown parts of the well-known Knowles head-motion shown and described in United States Reissue Letters Patent No. 7,784 and also a shuttle-box pattern-chain mechanism and a multiplier pattern-chain mechanism of well-known construction and operation and which is particularly shown and described in the United States Letters Patents No. 413,369 and No. 617,290 with my improvements combined therewith.

In the drawings, 1 is a detached portion of the frame of the head-motion for supporting the several parts of the pattern mechanism.

2 is a detached portion of the upper cylinder-gear, 3 the lower cylinder-gear, 4 the vibrator-gears, each mounted upon and rotatable on a vibrator-lever 5, pivotally mounted on a stationary shaft or rod 6, and 4' an indicator-lever.

7 is the multiplier pattern-chain cylinder, carrying the multiplier pattern-chain 8, made up of links carrying bars having tubes and rolls thereon in the usual way.

A pattern indicator-lever 9 (see Fig. 1) is pivoted at one end on an upright stand 10, secured to the frame, and extends over the multiplier pattern-chain 8 and has attached at its other end a link or connector 11 to one arm of an angle-lever 12, pivotally mounted on a stationary arm 13 and actuated by a spring 14, secured to a projection 12' and to a stationary part of the frame. The other arm of the angle-lever 12 engages a hub 15, fast on a longitudinally-sliding rod 16 and having fast thereon the hub 17' of a forked arm 17, which extends into an annular groove in the hub of a pin-wheel 18. The pin-wheel 18 is fast on a driven shaft 19 and is adapted to be moved into and out of engagement with the star-wheel 20, secured to a sleeve connected with the box-pattern-chain cylinder 21, (see Fig. 4,) loose on a shaft 22 and carrying a pattern-chain 23, made up of links carrying bars having tubes and rolls thereon in the usual way.

Extending over the box pattern-chain 23 and adapted to be engaged by an extended bar 23' thereon is a foot 24' of a pattern indicator-lever 24, pivoted on the rod 6. The lever 24 is connected by a link 25 (see Fig. 2)



with one arm of an angle-lever 26, pivotally mounted at 27' on the stationary arm 27 and actuated by a spring 28, secured at one end to a projection 26' and at its other end to a stationary part of the frame. The other arm of the angle-lever 26 engages a hub 29, fast on a longitudinally-sliding rod 30, mounted in suitable bearings and having fast thereon the hub 31' of a forked arm 31, which engages and moves a pin-wheel 32, splined on the driven shaft 19. The pin-wheel 32 is adapted to be moved into and out of engagement with the star-wheel 33, connected to the multiplier-pattern-chain cylinder. (See Fig. 2.)

All of the above-mentioned parts may be of the usual and well-known construction.

I will now describe my improvements combined with the parts above referred to.

The pin-wheel shaft 19 has fast thereon a pinion 34, which meshes with and is driven in this instance by a pinion 35, fast on a driven shaft 36. (See Fig. 4.) The pinion 34 meshes with and drives a pinion 37, loose on a stud 38, and the pinion 37 meshes with and drives a gear 39, splined on a shaft 40, mounted in suitable bearings on the frame. The shaft 40 has fast thereon a sleeve 41, in this instance secured by a screw 42. (See Fig. 2.) On the sleeve 41 are splined the hubs 43' and 44' of two cams 43 and 44. The cams 43 and 44 extend under and are adapted to engage the runs 5', attached to the vibrator-levers 5. (See Fig. 4.) The cams 43 and 44 are adapted to be moved under the two outer vibrator-levers 5, as shown in Fig. 2, and through the revolution of said cams to raise or lower said vibrator-levers, as desired, and said cams 43 and 44 are also adapted to be moved out of line with and out of the path of the outer vibrator-levers 5, as shown in Fig. 3, to allow said vibrator-levers to operate in the usual way, controlled by the indications of the box pattern-chain 23.

To move the cams 43 and 44 into and out of operative position, I provide in this instance half-balls 23'' (see Fig. 4) on both sides or edges of the box pattern-chain 23. The half-balls 23'' on one side or edge of the box pattern-chain 23 are adapted to pass under and engage the foot 45' on an indicator-lever 45, pivotally mounted on the shaft or rod 6. (See Fig. 4.) A link or connector 46 connects said lever 45 with one arm of an angle-lever 47, pivotally mounted at 48 on an arm 49, actuated by a spring 50. The other arm of the angle-lever 47 engages a hub 51, fast on a longitudinally-moving rod 52, mounted in suitable supports, and which has fast thereon a hub 53' of an arm 53, having a forked end which engages an annular groove 43'' in the hub 43' of the cam 43. According to whether or not a half-ball 23'' or a tube comes under the foot 45' of the lever 45 the

cam 43 through intermediate connections is moved under the outer vibrator-lever 5, as shown in Fig. 2, and through the revolution of the shaft 40 raises and lowers said vibrator-lever, as desired, or is moved out from under said vibrator-lever, as shown in Fig. 2, to allow said vibrator-lever to be raised and lowered by the ordinary indications of the box pattern-chain 23.

The half-balls 23'' on the opposite side or edge of the box pattern-chain 23 are adapted to pass under the foot of an indicator-lever 45<sup>a</sup>, corresponding to the lever 45. The lever 45<sup>a</sup> is connected by a link or connector 46<sup>a</sup> with one arm of an angle-lever 47<sup>a</sup>, pivoted on a pin 48<sup>a</sup> on the arm 49 and actuated by a spring 50<sup>a</sup>. The other arm of the angle-lever 47<sup>a</sup> engages a hub 51<sup>a</sup>, fast on a longitudinally-sliding rod 52<sup>a</sup>, mounted in suitable supports and having fast thereon the hub 53<sup>a</sup>' of an arm 53<sup>a</sup>, having its upperforked end engaging an annular recess 44'' in the hub 44' of the cam 44. According to whether or not a half-ball 23'' or a tube comes under the foot of the lever 45<sup>a</sup> the cam 44 through intermediate connections is moved under the outer vibrator-lever 5, as shown in Fig. 2, and through the revolution of the shaft 40 raises and lowers said vibrator-lever 5, as desired, or is moved out from under said vibrator-lever, as shown in Fig. 2, to allow said vibrator-lever to be raised and lowered by the ordinary indications of the box pattern-chain 23. It will be understood that during the time the cams 43 and 44 are under the vibrator-levers 5 the box pattern-chain 23 is at rest, and the vibrator-levers are raised and lowered through the revolution of said cams, and the shuttle-boxes operated through the movement of said levers will be raised and lowered according to the shape of said cams.

In Figs. 5 and 6 I have shown a modified construction of the cams 43 and 44 shown in the other figures. In said Figs. 5 and 6 each cam is made as a double cam of a width to extend under two of the vibrator-levers 5 instead of under one, as shown in the other figures, and each cam 43<sup>a</sup> and 44<sup>a</sup> has thereon in this instance two sets of cam-surfaces 43<sup>a</sup>' and 43<sup>a</sup>'' and 44<sup>a</sup>' and 44<sup>a</sup>'', one set of cam-surfaces on a cam extending at right angles to the second set of cam-surfaces on said cam. By the construction of the cams shown in Figs. 5 and 6 all four of the indicator-levers may be operated by the cams, and the four shuttle-boxes will be moved according to the shape of the cams.

From the above description, in connection with the drawings, the operation of my improvements will be readily understood by those skilled in the art.

The box pattern-chain and the multiplier pattern-chain may be operated in the usual way, and through the half-balls 23'' or other



indicating-surfaces on the box pattern-chain 23 the sliding cams 43 and 44 are moved into or out of operative position, as desired, and when in operative position the shuttle-boxes 5 are moved through the revolution of said cams for a number of repeats, as desired, the box pattern-chain being at rest.

It will be understood that the details of construction of my improvements may be 10 varied, if desired, and they may be adapted to be applied to and combined with a multiplier pattern-chain and a box pattern-chain mechanism of ordinary construction, and particularly of the construction shown and 15 described above. In case of only two change shuttle-boxes and one indicator-lever for the box pattern-chain then only one cam and its operating mechanism will be used.

Having thus described my invention, what 20 I claim as new, and desire to secure by Letters Patent, is—

1. In a pattern mechanism for looms, the combination with a multiplier pattern-chain, and an indicator-lever therefor, a box pattern-chain, and an indicator-lever therefor, 25 and connections intermediate the box pattern-chain and the multiplier pattern-chain, of a vibrator-lever, a rotatable cam and means for moving said cam into and out of 30 operative position, relatively to the vibrator-lever.

2. In a pattern mechanism for looms, the combination with a multiplier pattern-chain, and an indicator-lever therefor, a box pattern-chain and indicator-levers therefor, and 35 connections intermediate the box pattern-chain and the multiplier pattern-chain, of

vibrator-levers, rotatable cams and means for moving said cams into and out of operative position, relatively to the vibrator-levers. 40

3. In a pattern mechanism for looms, the combination with a multiplier pattern-chain, and an indicator-lever therefor, a box pattern-chain, and indicator-levers therefor, and 45 connections intermediate the box pattern-chain and the multiplier pattern-chain, of vibrator-levers, rotatable cams, and means for moving said cams into and out of operative position relatively to the vibrator-levers, to cause said levers to be moved 50 through the rotation of said cams, independently of the box pattern-chain for a predetermined time.

4. In a pattern mechanism for looms, the combination with a multiplier pattern-chain, and an indicator-lever therefor, a box pattern-chain, and indicator-levers therefor, and connections intermediate the box pattern-chain and the multiplier pattern-chain, of 60 vibrator-levers, rotatable cams, and means for moving said cams into and out of operative position, relatively to the vibrator-levers, to cause said levers to be moved, through the rotation of said cams, independently of the box pattern-chain, for a predetermined time, and to allow said levers to be 65 moved independently of said cams by the box pattern-chain, for a predetermined time.

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Witnesses:

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