No. 657,115. Patented Sept. 4, 1900.

G. F. HUTCHINS.

LOOM.

(Application filed Mar. 8, 1900.)

(No Model.) 4 Sheets—Sheet 1.

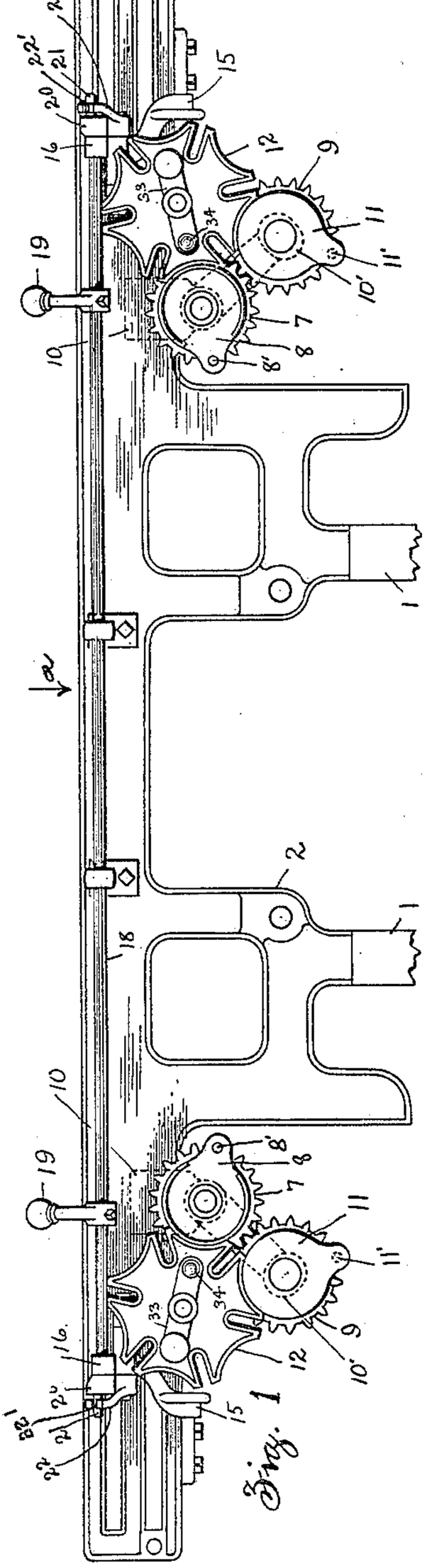

Fig. 1

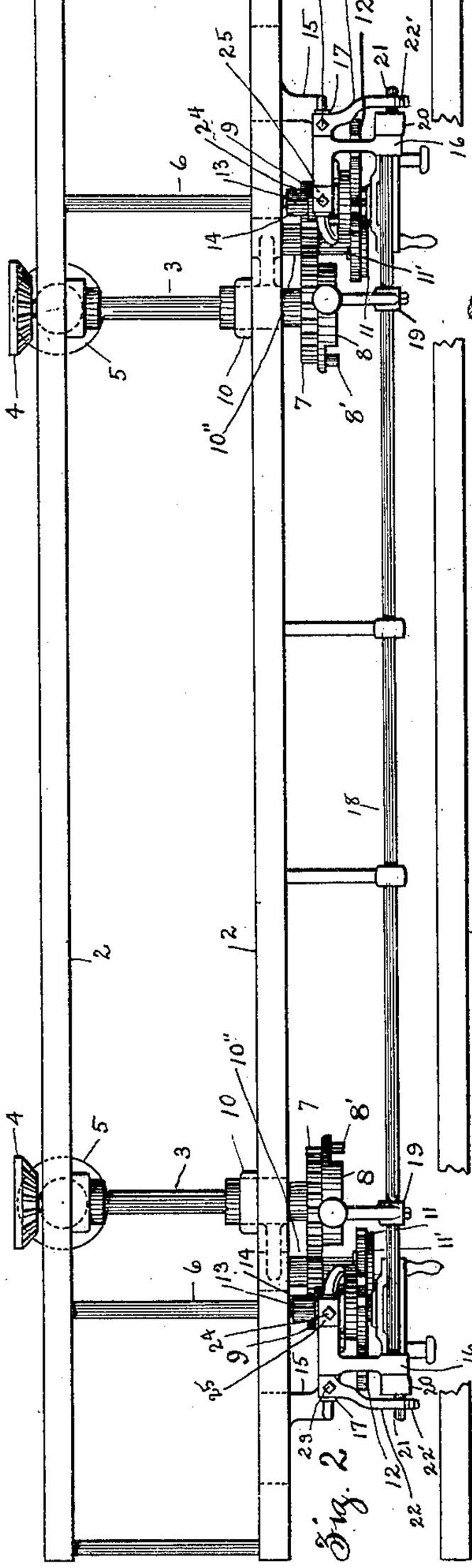

Fig. 2

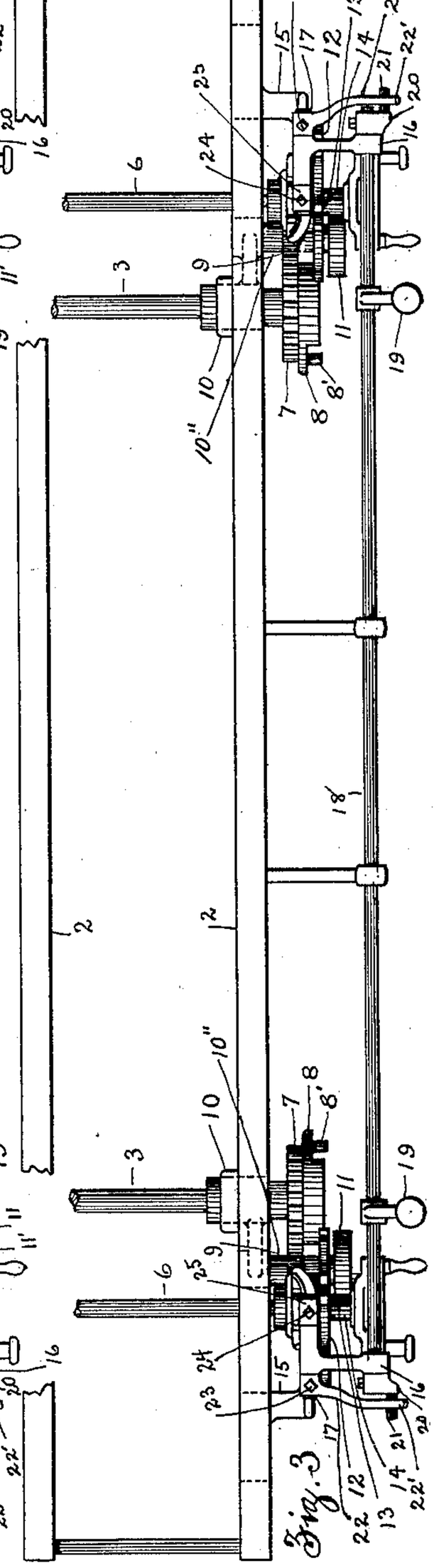

Fig. 3

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(No Model.) 4 Sheets—Sheet 2.

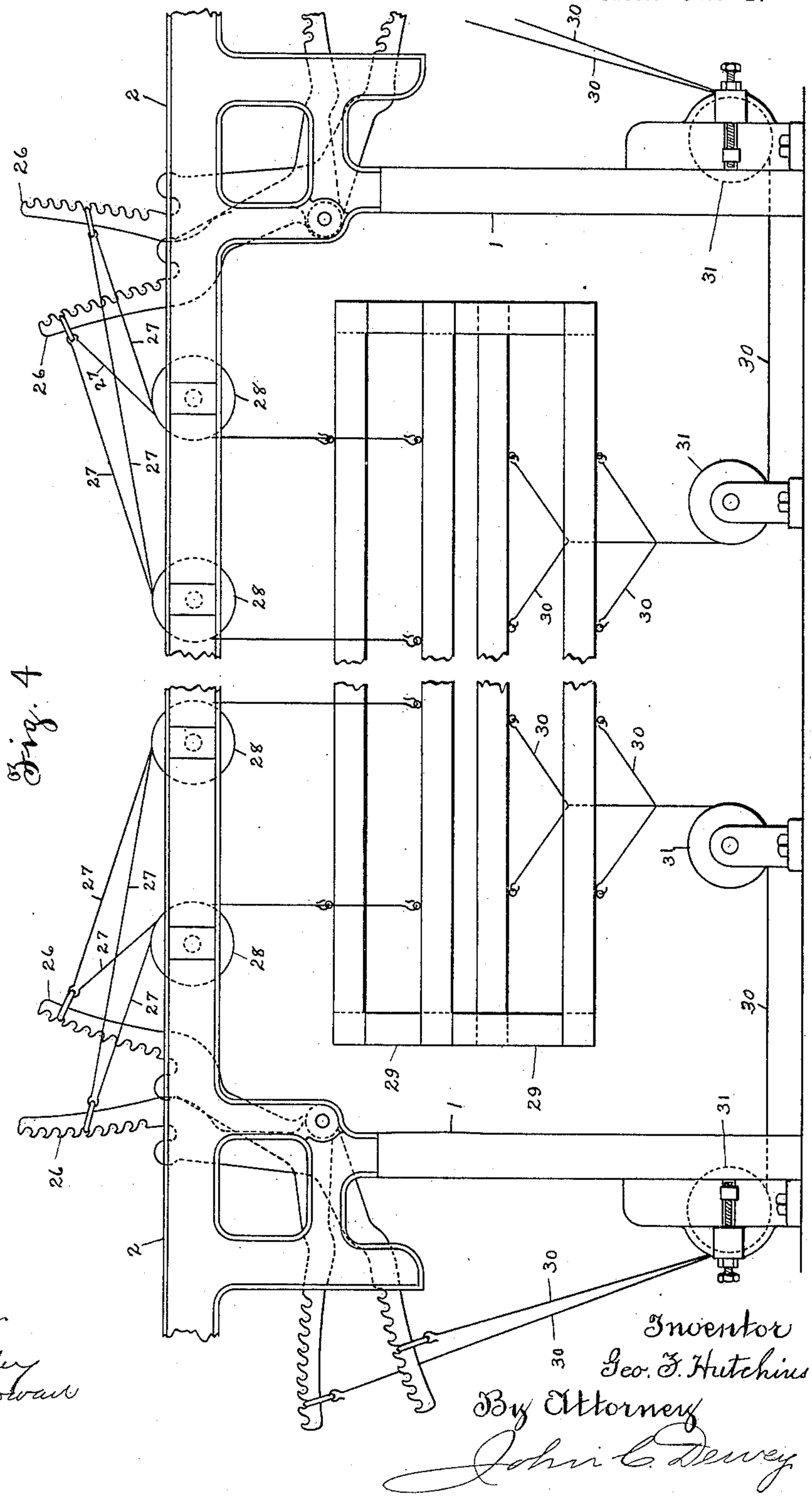

Fig. 4.

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(Application filed Mar. 8, 1900.)

(No Model.) 4 Sheets—Sheet 3.

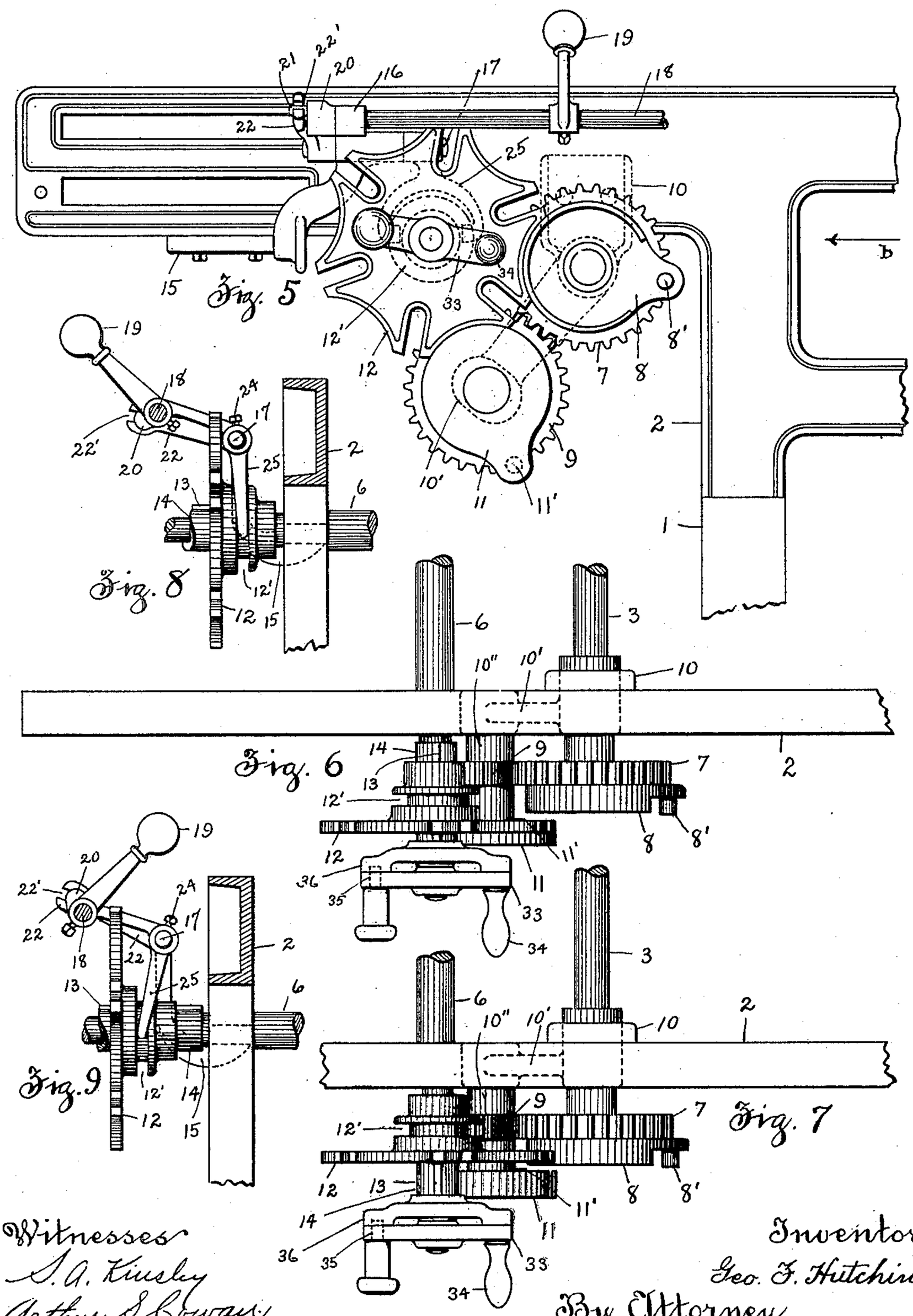

Fig. 5

Fig. 8

Fig. 9

Fig. 6

Fig. 7

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(No Model.)

4 Sheets—Sheet 4.

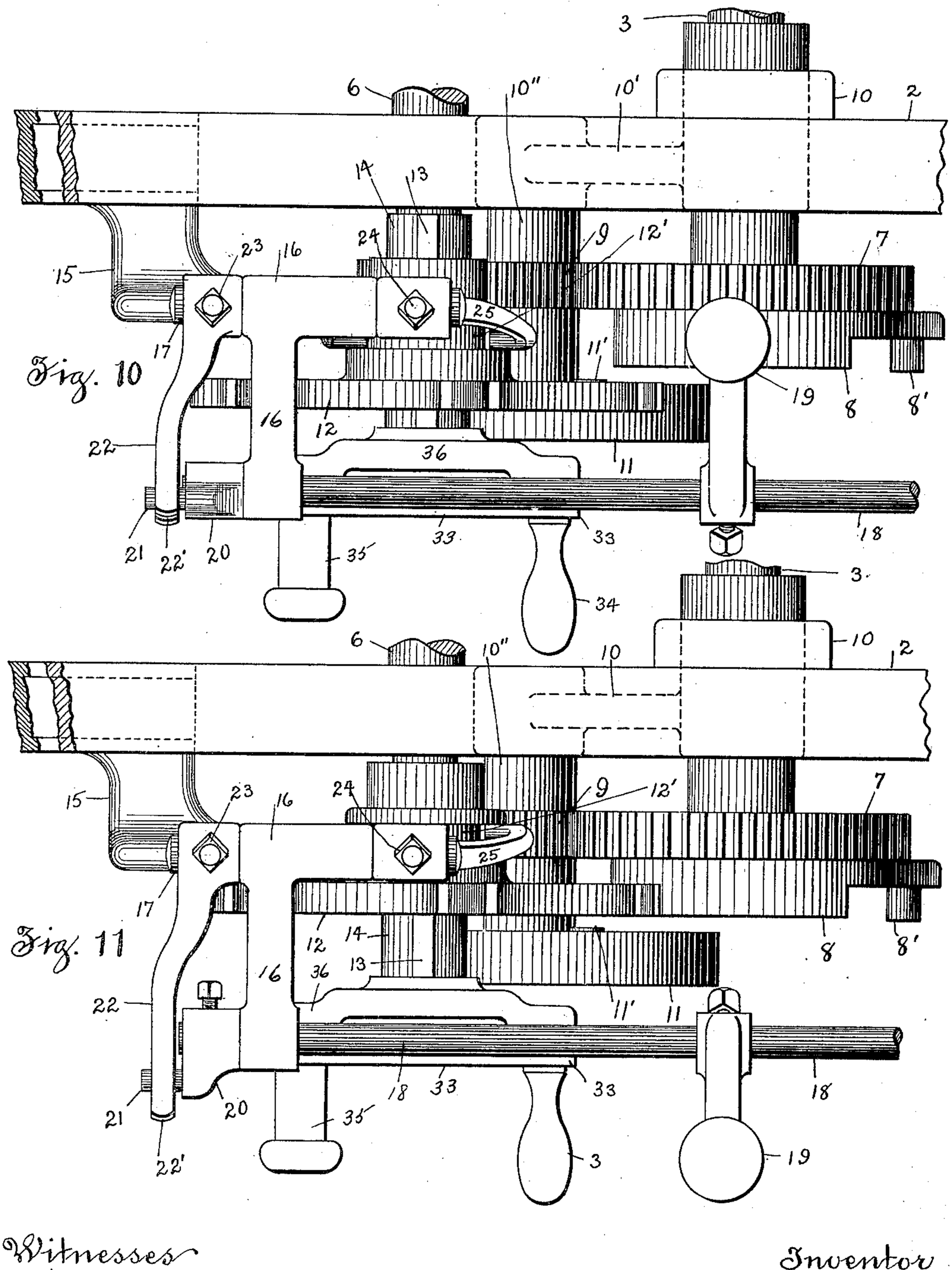

Fig. 10

Fig. 11

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UNITED STATES PATENT OFFICE.

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

LOOM.

SPECIFICATION forming part of Letters Patent No. 657,115, dated September 4, 1900.

Application filed March 8, 1900. Serial No. 7,832. (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 Looms, of which the following is a specification.

My invention relates to looms, and more particularly to the head-motion of looms; and the object of my invention is to provide an improved construction of the mechanism for moving forward and reversing the pattern-chain mechanism and moving the harnesses connected therewith and for connecting two head-motions in one loom to simultaneously move forward or reverse both pattern mechanisms, if desired.

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

I have shown in the drawings two head-motions, one at each end of the loom, and one head-motion is the exact reverse of the other, but their pattern-chains correspond, so that the movement of a given harness-jack on one head is duplicated on the other head. The harness-jacks correspond and are attached to the harness-frames in such a manner as to divide equally between them the work of raising and lowering the harness-frames. There is a connection between the two head-motions, operated from either end of the loom, to throw into operation the two mechanisms for producing forward motion of the pattern-chain mechanisms or for reversing the same, as will be hereinafter fully described.

I have only shown in the drawings sufficient parts of a loom to enable those skilled in the art to understand the operation of my improvements.

Referring to the drawings, Figure 1 is a front view of my improvements. Fig. 2 is a plan view of the parts shown in Fig. 1, looking in the direction of arrow *a*, same figure, showing one position of the shifting mechanism. Fig. 3 corresponds to Fig. 2, but shows the opposite position of the shifting mechanism. Fig. 4 shows the arrangement of the harness-jacks, harness-frames, sheaves, and connections, not shown in Figs. 1, 2, and 3. Fig. 5 shows, on an enlarged scale, a front view of the mechanism shown at the left in Fig. 1. Fig. 6 is a plan view of the star-wheel and pin-wheel mechanism shown in Fig. 5. The star-wheel is shown in engagement with the outer pin-wheel. Fig. 7 corresponds to Fig. 6, but shows the star-wheel in engagement with the inner pin-wheel. Fig. 8 is a sectional view of the shifting mechanism, looking in the direction of arrow *b*, Fig. 5, when the star-wheel is in engagement with the inner pin-wheel, as shown in Fig. 7. Fig. 9 corresponds to Fig. 8, but shows the opposite position of the shifting mechanism when the star-wheel is in engagement with the outer pin-wheel, as shown in Fig. 6. Fig. 10 is, on an enlarged scale, a plan view of the parts shown in Fig. 5, showing the star-wheel in engagement with the outer pin-wheel; and Fig. 11 corresponds to Fig. 10, but shows the opposite position of the shifting mechanism with the star-wheel in engagement with the inner pin-wheel.

In the accompanying drawings, 1 1 are the loom side frames and 2 2 the loom-arches, on which the shedding mechanism is supported and in which are journaled the horizontal transverse driving-shafts 3 3, connected by the beveled gear 4 (see Fig. 2) with the beveled gear 5 on a vertical shaft connected with any of the rotating shafts of the loom in the ordinary way. Horizontal shafts 6 6 carry the pattern-chain barrels (not shown) in the ordinary way.

As the two mechanisms shown in Figs. 1, 2, and 3 are duplicates of each other, a description of one will answer for a description of both.

Fast on the driving-shaft 3 is a gear 7, carrying a pin-wheel 8, with one pin 8′ thereon. At the lower end of an arm 10′ on a stand 10 and mounted on a stud 10″, fast in said arm 10′, is a second gear 9 in alinement with and in mesh with the gear 7. Fast on the hub of the gear 9 is a second pin-wheel 11, with one pin 11′. The pin-wheels 8 and 11 are out of alinement and have a constant and regular rotation in opposite directions. A star-wheel 12 slides on a spline 13 on a sleeve 14, fast on the pattern-shaft 6, and is adapted to be

moved into engagement with the inner pin-wheel 8 and out of engagement with the outer pin-wheel 11, or into engagement with the outer pin-wheel 11 and out of engagement with the inner pin-wheel 8, to cause the pattern-chain to move forward or backward, as desired.

I will now describe the mechanism for moving the star-wheel as above stated.

A stand 15, secured to the front loom-arch, has at its upper end an arm 16, having bearings for a short shaft 17 and one end of the long shaft 18, extending across the loom. On the long shaft 18 are two handles 19, one near each end of the loom, for turning the shaft 18. At each outer end of the shaft 18 is a crank 20, having a pin 21, which engages the open end slot 22′ in the arm 22, fastened at its inner end by a set-screw 23 on the short shaft 17. The opposite end of the short shaft 17 has secured thereon by set-screw 24 the upper end of the forked arm 25. The lower forked end of the arm 25 extends into an annular groove 12′ in the hub of the star-wheel 12. It will be seen that by moving the handle 19 from the position shown in Fig. 10 to the position shown in Fig. 11 the star-wheel 12, through shaft 18, crank 20, pin 21, arm 22, shaft 17, and forked arm 25 will be moved out of engagement with the outer pin-wheel 11 and into engagement with the inner pin-wheel 8, as shown in Fig. 11, to cause the pattern-chain to have a reverse motion. By means of the shaft 18 connecting the two heads the star-wheel in each head-motion is moved simultaneously to cause the pattern-surface of each head to move forward or backward, as desired.

Referring to Fig. 4, 26 26 are two sets of harness jacks or levers mounted at each end of the loom. Connections 27 extend from each set of harness-jacks over sheaves 28 to the upper side of the harness-frames 29, and connections 30 extend from the opposite ends of the jacks over sheaves 31 to the under side of the harness-jacks. The operation of the shedding mechanisms will move simultaneously the two sets of harness-jacks to raise and lower the harnesses.

In connection with the star-wheel 12 I may use the ordinary handle-bar 33, fast on the pattern-chain shaft 6 and having a handle 34 and a spring-actuated pin 35 to extend through a hole in the bar 33 into the bar 36, loose on the shaft 6 in the ordinary way. The purpose of the handle-bar 33 is to turn the pattern-chain shaft 6 in either direction by hand, independently of the gearing, by withdrawing the spring-actuated pin 35 in the usual way.

The advantages of my improvements will be readily appreciated by those skilled in the art. By using two pin-wheels, revolving in opposite directions, and one star-wheel, adapted to be moved into engagement with one pin-wheel and out of engagement with the other, and vice versa, the shaft of the pattern-chain cylinder, operated through the star-wheel, will be moved in a forward direction or a backward direction, as desired. By connecting the shifting mechanism of the star-wheel at one end of the loom with the shifting mechanism of the star-wheel at the other end of the loom through the long shaft 18 I can simultaneously move both star-wheels to cause both pattern-surfaces to move forward or to reverse their motion, as desired.

It will be understood that the details of construction of my improvements may be varied, 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 of a plurality of head-motions, each provided with pin-wheels revolving in opposite directions and a star-wheel adapted to be operated by each of said pin-wheels, mechanism intermediate said head-motions for simultaneously moving the star and pin wheels of each head-motion into and out of engagement to communicate a simultaneous forward-and-backward movement to said head-motions.

2. In a loom provided with two head-motions, each head-motion having two pin-wheels revolving in opposite directions, and a star-wheel adapted to be engaged and revolved by the pin-wheels, the combination with the star-wheel of each head-motion, of intermediate mechanism for simultaneously moving both star-wheels out of engagement with two of the pin-wheels, and into engagement with the other two pin-wheels, to communicate a forward or backward motion to the pattern-chain cylinder-shaft of each head-motion simultaneously, substantially as shown and described.

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Witnesses:
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