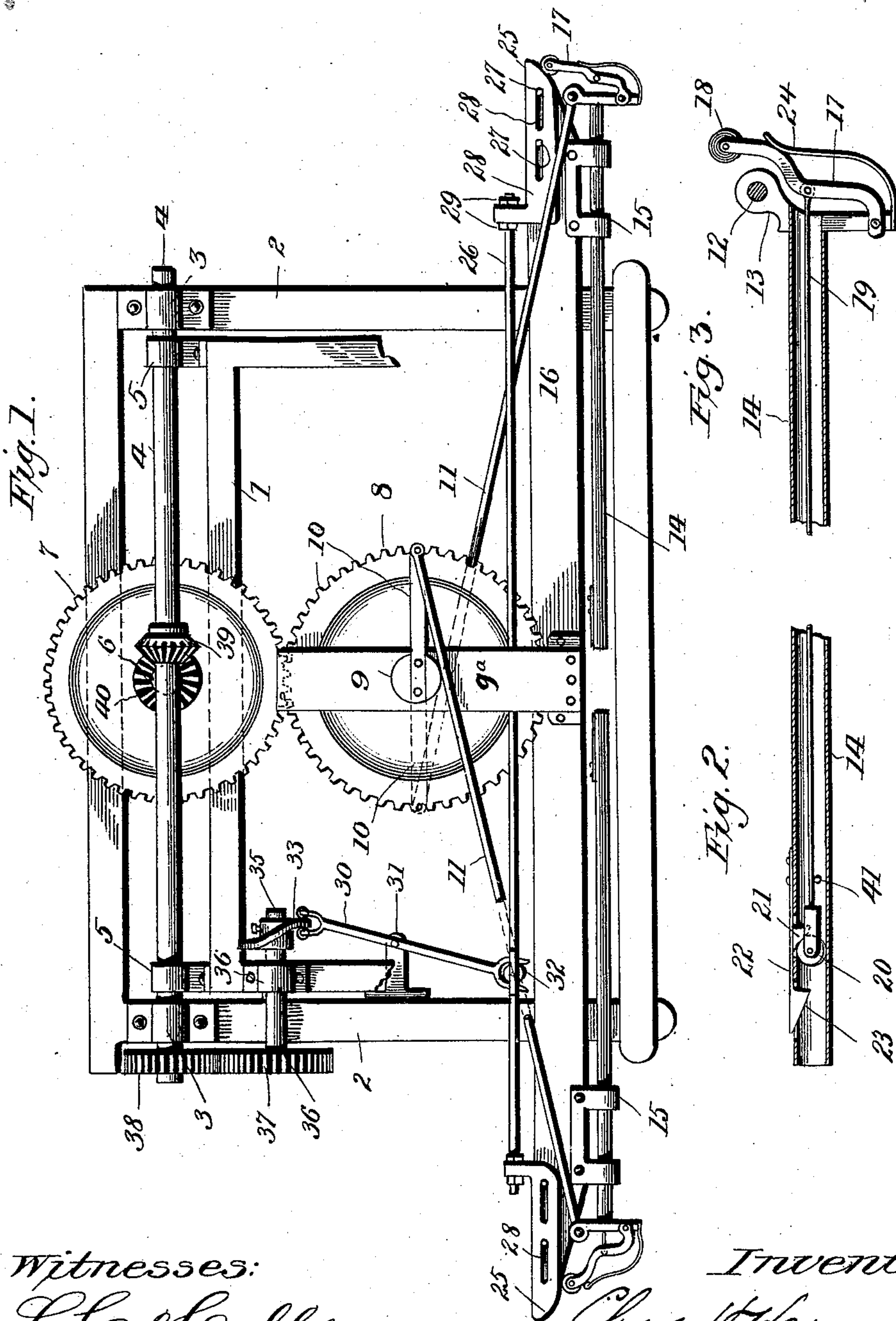


(No Model.)

C. H. HEINDEL.
SHUTTLE MOTION FOR LOOMS.

No. 575,927.

Patented Jan. 26, 1897.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES H. HEINDEL, OF GLEN ROCK, PENNSYLVANIA.

SHUTTLE-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 575,927, dated January 26, 1897.

Application filed March 9, 1896. Serial No. 582,388. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. HEINDEL, a citizen of the United States, residing at Glen Rock, in the county of York and State of Pennsylvania, have invented certain new and useful Improvements in Shuttle-Motions for Looms; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form a part of this specification.

My invention relates to shuttle-motions for looms; and it has for its object to provide improved means for changing the shuttle from one shuttle-bar to the other, so as to render the parts simple in construction and efficient in action with comparatively little friction and with ease of movement of the parts.

To the accomplishment of the foregoing and such other objects as may hereinafter appear the invention consists in the construction and in the combination of parts hereinafter particularly described, and then sought to be specifically defined by the claims, reference being had to the accompanying drawings, forming a part hereof, and in which—

Figure 1 is a side elevation of so much of a loom as is necessary to illustrate the application of the invention, and Figs. 2 and 3 are detail views, on an enlarged scale, of certain of the parts.

The numeral 1 designates a portion of a loom-frame, and 2 the swinging lathe, which is provided at its upper end with boxes 3, through which passes a shaft 4 on which the lathe may swing, said shaft being supported by and revolving in boxes 5, formed on the loom-frame.

The numeral 6 designates a shaft which will be supported in suitable boxes connected to the loom-frame and which will be rotated by connection with a suitable source of power. (Not necessary to illustrate.) This shaft carries a cog-wheel 7, which meshes with and transmits motion to the cog-wheel 8, provided with a shaft or hub 9, journaled in two upright plates or standards 9^a, suitably supported upon one of the lower timbers of the loom-frame. The cog-wheel 8 has connected to it

two crank-arms 10, to which are pivotally connected the ends of the two rods or arms 11, which at their outer ends are connected by bolts 12 to the brackets 13, which are connected to the outer ends of the hollow shuttle-bars 14. These shuttle-bars slide in the boxes 15, connected, say, to the lower timber or bar 16 of the loom-frame, and are moved back and forth in the rotation of the cog-wheel 8 through the instrumentality of the bars or rods 11, said cog-wheel making a complete rotation in the reciprocation of the shuttle-bars.

To the brackets 13 of the shuttle-bars are pivoted the levers 17, which carry at their upper end friction-rollers 18 and have connected to them rods 19, which pass through the hollow shuttle-bars and carry at their inner ends friction-rollers 20, adapted to bear against a beveled projection 21 on the inner faces of the springs 22, which are connected to the shuttle-bars and are provided with hooks 23 to engage the shuttle and hold it to the shuttle-bar by which it may for the time be carried. By drawing on the rod 19 through the instrumentality of the lever 17 the friction-roller 20 is made to press against the beveled projection 21, so as to lift the spring-catch 22 and thus release the shuttle, said rod and friction-roller being returned to its normal condition by means of a spring 24, which is caused to bear against the lever 17.

The levers 17 are acted on in alternation by cam-blocks 25, which are attached to opposite ends of a reciprocating rod 26, and which are guided in their movements by pins 27, projecting, say, from the side of the lower beam 16 and entering elongated slots 28 in the cam-blocks. These cam-blocks are adjustable on the reciprocating rod 26, so as to regulate their throw, the preferred means for effecting their adjustment being the nuts 29, fitting on opposite sides of each of the cam-blocks and working on screw-threads formed on the ends of the reciprocating rods, as illustrated. This rod 26 is reciprocated by means of a lever 30, pivoted to a bracket 31, and having its lower end forked so as to fit to a friction-roller 32, pivotally connected to the rod. The upper end of the lever 30 is acted on by a cam 33 of such construction that in its rotation it will move the lever first

in one direction and then in the other, so as to reciprocate the rod 26 back and forth. This cam is preferably in the form of an irregularly-shaped wheel, which fits between
 5 friction-rollers attached to the upper end of the lever 30 and is mounted upon a shaft 35, which is journaled in a box 36 and carries at its outer end a cog-wheel 37, with which meshes a smaller cog-wheel 38, attached to
 10 the end of the shaft 4. This shaft is revolved by means of a beveled pinion 39, keyed thereto, and which meshes with a pinion 40, keyed to the shaft 6. The cog-wheel 37 is made larger than the wheel 38, so as to reduce the
 15 speed at which the rod 26 will be reciprocated as compared with the speed at which the shuttle-bars will be moved, the shaft 35, to which the wheel 37 is connected, making about one-half the number of revolutions that is made
 20 by the shaft 3.

In the position in which the parts are illustrated in Fig. 1 of the drawings the shuttle is about to exchange from the left shuttle-bar to the right and the cam-block on the left
 25 of the rod 26 has come in contact with the roller on the end of the left-hand lever 17 and pressed that lever so as to draw outward the rod 11 and thus release the shuttle from the grip of the spring-catch 22. The shuttle
 30 is next caught by the spring-catch of the shuttle-bar to the right, so that it will be carried by that shuttle-bar as the same is moved through the right-hand rod 11 as the wheel 8 continues its rotation. By the time that the
 35 right-hand shuttle-bar has completed its movement and the parts again brought into position for the shuttle to be exchanged from the right to the left shuttle-bar the rod 26 has been moved to the right, so as to depress
 40 the right-hand lever 17, in order to move the rod 19 so as to disengage the catch 22 from the shuttle in order that the shuttle may be grasped by the catch to the left-hand shuttle-bar, the left-hand cam-block in the mean-
 45 while having been drawn in from engagement with the left-hand lever 17, so that the spring 24 has thrown the rod 19 inward and left the catch 22 of the left-hand shuttle-bar in position to grasp the shuttle. The several
 50 parts will be so proportioned that the shuttle-bars and the cam-blocks will be operated in time to admit of the operation described.

In order to limit the outward movement of the rods 19, which carry the friction-rollers
 55 20, I prefer to place pins or stops 41 inside the shuttle-bar, so that the friction-wheel ends of the rods 11 will contact with said stops and thus limit the outward movement of the rods.

60 Under the construction and arrangement described the several parts are moved smoothly and without sudden or jerking motions, and the friction between the parts is reduced to the minimum. The parts are also
 65 comparatively few and simple in construction, and thereby materially reduce the cost of building the machine, and are also positive

in action. I am also enabled to dispense with the employment of chains, which have been commonly employed in machines of this character, and in that way I reduce the friction and
 70 also the wear on the parts.

I have illustrated and described with particularity the preferred construction and arrangement of the several parts; but changes
 75 can be made therein without departing from the essential features of the invention.

Having described my invention and set forth its merits, what I claim is—

1. In a shuttle-motion for looms, the combination of the continuously-rotatable cog-wheel provided with oppositely-extending crank-arms, the two shuttle-bars, the rods directly connected at one end to said shuttle-bars and at the other end to said crank-arms,
 80 so that the crank-arms will make a complete revolution in reciprocating the shuttle-bar rods, and means for rotating said cog-wheel continuously in one direction, substantially as and for the purposes described. 85 90

2. In a shuttle-motion for looms, the combination of the two shuttle-bars, the shuttle-catches, the rods connected to said bars, means for actuating said rods to reciprocate the shuttle-bars, the levers connected with the shuttle-bars, the rods connected to said levers and extending through the shuttle-bars for the purpose of releasing the shuttle-catches, the single reciprocating rod provided with cam-blocks to engage with said levers to actuate
 95 the shuttle-releasing rods, and means for reciprocating the rod which carries the cam-blocks, substantially as and for the purposes described. 100

3. In a shuttle-motion for looms, the combination of the shuttle-bars, the shuttle-catches, levers pivotally connected with said bars, means for actuating the shuttle-bars, the rods for releasing the shuttle-catches extending through the shuttle-bars and connected to said
 105 levers, the springs bearing against said levers to restore said rods to their normal positions, the horizontally-reciprocating single rod provided with the cam-blocks arranged to contact with said levers in the reciprocation of
 110 the blocks, the oscillating lever connected with the reciprocating rod, and a cam for moving said lever back and forth, substantially as and for the purposes described. 115

4. In a shuttle-motion for looms, the combination with the shuttle-bars, shuttle-catches, means for actuating the shuttle-bars, and shuttle-catch-releasing rods, of the single reciprocating rod provided with cam-blocks to actuate the shuttle-catch-releasing rods, the
 120 oscillating lever connected with the said reciprocating rod, the shaft provided at one end with a cam to engage said lever and at the other end with a power-communicating wheel, and the driven shaft provided with a power-
 125 wheel of smaller diameter than said other wheel and meshing therewith, substantially as and for the purposes described. 130

5. In a shuttle-motion for looms, the combi-

10 nation of the continuously-rotatable cog-wheel provided with crank-arms, the drive-shaft provided with a cog-wheel meshing with the crank cog-wheel, the shuttle-bars, the
5 shuttle-catches, the rods connecting said bars with said crank-arms, the shuttle-catch-releasing rods, pivoted levers connected to the outer ends of said rods, the reciprocating rod provided with cam-blocks to engage said
10 levers for actuating the shuttle-catch-releasing rods, the lever connected to the rod provided with the cam-blocks, the shaft having at one end a cam to engage said lever and at

the other end provided with a cog-wheel, the shaft provided with a beveled pinion mesh- 15
ing with a beveled pinion on the drive-shaft and provided with a cog-wheel meshing with the wheel on the cam-shaft, the several parts being arranged to operate, substantially as
20 and for the purposes described.

In testimony whereof I affix my signature in presence of two witnesses.

CHAS. H. HEINDEL.

Witnesses:

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W. F. KINTZING.