

No. 673,839.

Patented May 7, 1901.

W. F. KINTZING.  
SHUTTLE MOTION FOR LOOMS.

(Application filed Apr. 9, 1900.)

(No Model.)

2 Sheets—Sheet 1.

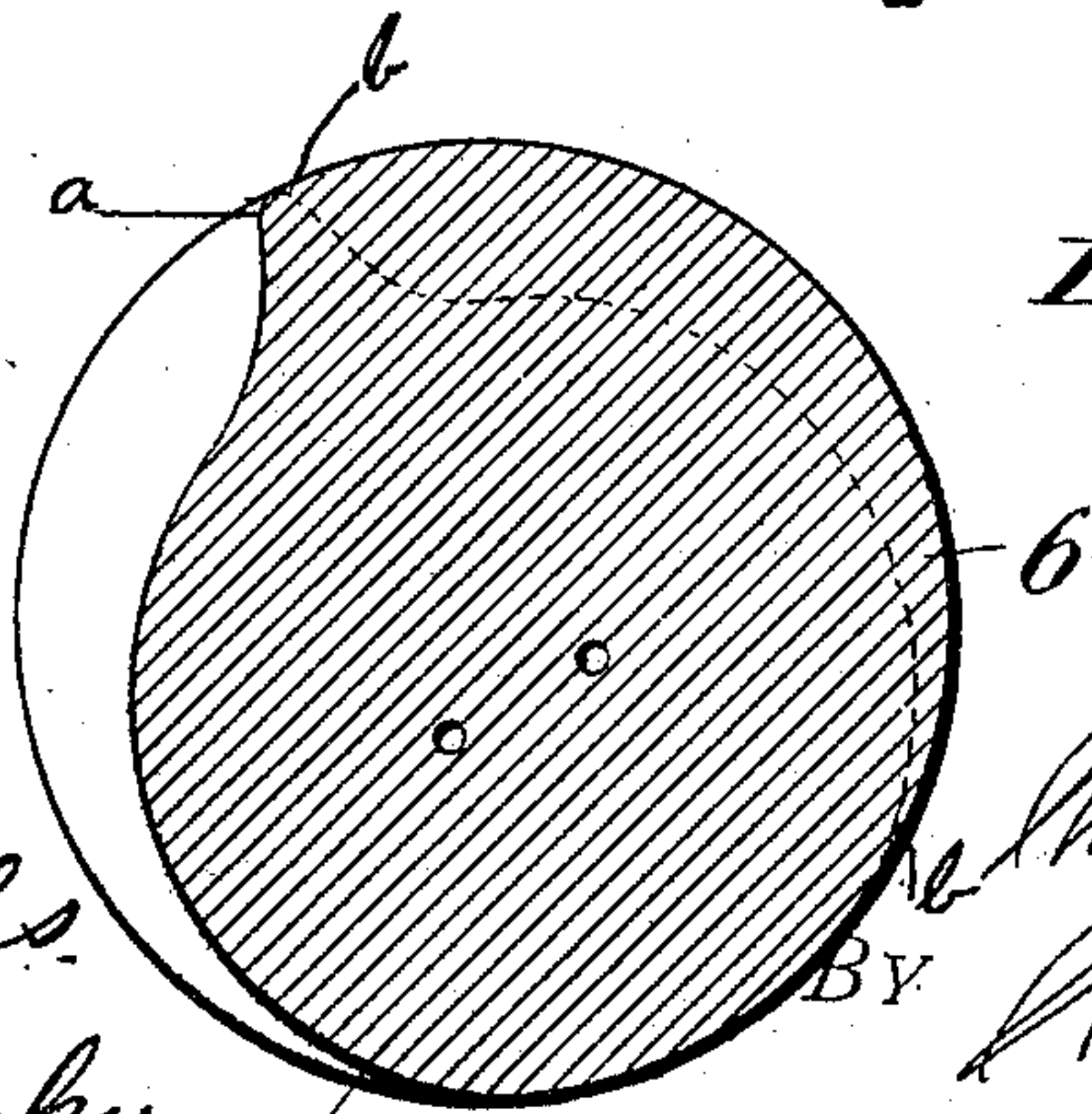
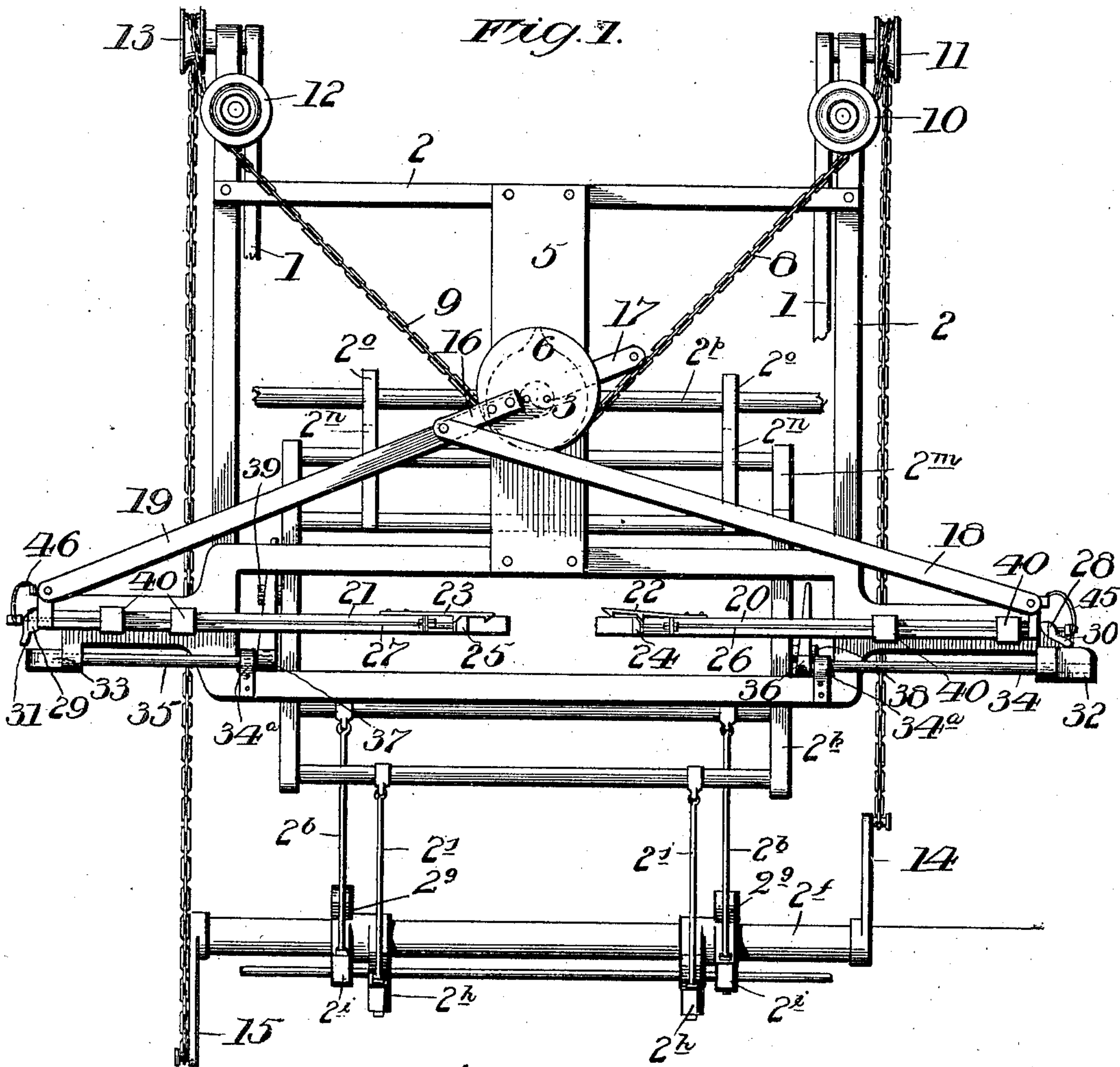


Fig. 6.

WITNESSES:

L. C. Hills.

Chester A. Baker.

INVENTOR

William F. Kintzing.

BY *[Signature]*

Attorney

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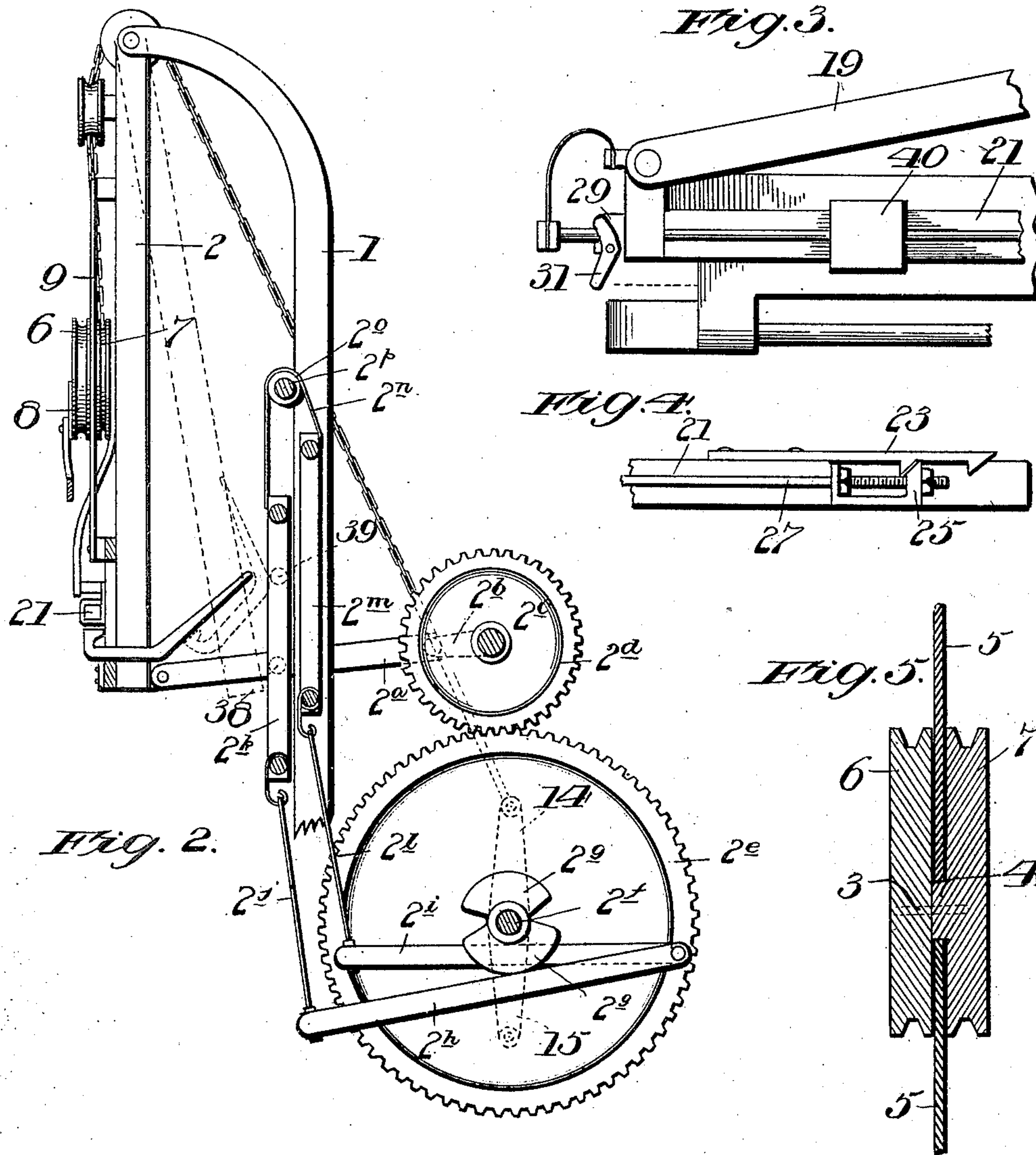
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BY *[Signature]*

Attorney



# UNITED STATES PATENT OFFICE.

WILLIAM F. KINTZING, OF GLENROCK, PENNSYLVANIA, ASSIGNOR OF ONE-HALF TO ARTHUR S. NORRISH, OF SAME PLACE.

## SHUTTLE-MOTION FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 673,839, dated May 7, 1901.

Application filed April 9, 1900. Serial No. 12,116. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM F. KINTZING, a citizen of the United States, residing at Glenrock, 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 letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to shuttle-motions for looms, designed more particularly for looms for weaving wire-cloth, although not confined thereto, and may be adapted for weaving other material.

The invention has for its object to take up the slack in the chains employed in connection with other elements for reciprocating the shuttle-bars.

It also has for its object to provide improved means for releasing the shuttle when to be transferred from one shuttle-bar to another.

It has further for its object to provide improved features of construction and arrangement of parts; and 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 front elevation of part of a loom with my invention applied; Fig. 2, an end elevation, and Figs. 3, 4, 5, and 6 are details of parts of the device.

In the drawings the numeral 1 designates the loom-frame, from the upper part of which is swung the lathe-frame 2, the lower end of the lathe-frame being connected by the pivoted arms 2<sup>a</sup> to the cranks 2<sup>b</sup> of the shaft 2<sup>c</sup>, which has a gear-wheel 2<sup>d</sup>, meshing with a gear-wheel 2<sup>e</sup> on the shaft 2<sup>f</sup>, which carries the cams 2<sup>g</sup>, which bear against the pivoted levers 2<sup>h</sup> and 2<sup>i</sup>, the levers 2<sup>h</sup> being connected by links or chains 2<sup>j</sup> to the member 2<sup>k</sup> of the

heddle-frame, the other levers 2<sup>i</sup> being connected by links or chains 2<sup>l</sup> to the other member 2<sup>m</sup> of the heddle-frame, the two members of the heddle-frame being connected together by the chains 2<sup>n</sup>, which pass over the rollers 2<sup>o</sup>, connected to a shaft 2<sup>p</sup>, suitably supported on the loom-frame 1.

The construction and arrangement of the parts so far referred to may be such as are ordinarily employed in looms for weaving wire-cloth and in general are such that the lathe-frame 2 is swung back and forth in the reciprocation of the shuttle-bars, and the two members of the heddle-frame are raised and lowered in alternation by reason of their connection to the levers 2<sup>h</sup> and 2<sup>i</sup>, which are depressed in alternation by the cams 2<sup>g</sup> upon the shaft 2<sup>f</sup>, said shaft having one revolution to every two revolutions of the crank-shaft 2<sup>c</sup> and the lathe-frame being swung backward as the shuttle-bar moves inward and forward as said bars are moved outward.

The numeral 5 designates an upright plate or bar suitably secured to the lathe-frame and having suitably journaled to it two chain-wheels 6 and 7, one on each side of the plate 5 and connected together, so as to revolve in unison, a suitable way of connecting the wheels together being by means of screws, passing through one wheel and into the other, said wheels at the point of their union being provided with a hub 4, which passes through an opening in the plate 5, so as to thus journal the two wheels in said plate, although any other manner of connecting and supporting the wheels may be used. To each of these wheels is connected a chain, one of which is designated by the numeral 8, which passes across a sheave 10, mounted upon the lathe-frame, and thence around a sheave 11, mounted upon the upper end of said frame or on the loom-frame, and thence downwardly and at its lower end connected to a crank or arm 14 upon the shaft 2<sup>f</sup>, the other chain being designated by the numeral 9 and after leaving its wheel passes across the sheave 12 and around a sheave 13, both of which sheaves are similarly mounted to the other two sheaves, the chain then passing down and being connected to a crank or arm 15 upon the shaft 2<sup>f</sup>, the cranks 14 and 15 extending from said



shaft in opposite directions to each other, so that in the rotation of said shaft when one chain is unwound from its wheel the other chain will be wound upon its wheel, the purpose of which is to reciprocate the shuttle-bars back and forth, as ordinarily in looms of this character having two shuttle-bars, from one of which to the other the shuttle is transferred in the reciprocation of the bars, the shuttle-bars (designated by the numerals 20 and 21) being connected by the rods 18 and 19 to the arms 16 and 17, which are connected one to the chain-wheel 6 and the other to the chain-wheel 7, as indicated in the drawings. In looms of this character as heretofore constructed the chains 8 and 9 in the reciprocation or swinging of the lathe-frame have more or less slack, and hence the tension is irregular. For the purpose of taking up that slack and procuring a uniform tension I impart to the periphery of each of the wheels 6 and 7 an irregular or cam shaped surface, preferably of the form shown, each wheel having a reduced portion *a a* opposite to its swell or cam surface *b b*, the reduced portion of one wheel being alongside the cam-surface of the other wheel, thus forming oppositely-disposed cam-surfaces, so that in the swinging of the lathe-frame and in the winding and unwinding of the chains 8 and 9 the cam-shaped configuration of the chain-wheels 6 and 7 will take up the slack which otherwise would exist and by thus taking up the slack maintain a uniform tension.

The shuttle-bars 20 and 21 are supported in suitable bearings 40 and are hollow and provided, respectively, with the spring-catches 22 and 23 to hold the shuttle in the bar which is to reciprocate it. These shuttle-bars are provided internally with the reciprocating rods 26 and 27, one of which carries a block 24 and the other a block 25, adapted to contact with a shoulder on the spring-catch corresponding thereto, so as to lift the catch, and thus disengage the shuttle in order that the latter may be withdrawn by the other shuttle-bar when its spring-catch interlocks with the shuttle. The rods 26 and 27 are moved at the proper time to release the shuttle by the following means: The rods are provided, respectively, with the blocks 28 and 29, suitably secured thereto and having swinging fingers 30 and 31, pivoted to the blocks, which fingers normally hang in a pendent position, and when lifted their heels will bear against the blocks, so that when in such position if the finger comes in contact with the surface in its path of movement the particular rod whose finger is thus acted upon at the time will be drawn backward, so as to throw the block 24 or 25, as the case may be, against its spring-catch 22 or 23, and thus release the shuttle. These fingers are actuated by cam-blocks 32 and 33 which are attached, respectively, to rotatable shafts 34 and 35, journaled in suitable bearings 34<sup>a</sup>. These shafts carry the elbow-arms 36 and 37, one on each, and the member 2<sup>k</sup>

of the heddle-frame carries two rollers 38 and 39, one opposite to each of the arms 36 and 37, said rollers being so located that in one backward movement of the lathe-frame one of the elbow-arms will come in contact with one of said rollers, so that said arm will be moved so as to rotate the shaft to which it is connected, and thus throw the cam-block carried by said shaft out of the path of movement of the finger pending from the shuttle-releasing rod on that side of the frame, while the other elbow-arm will stand in such position that the cam-block actuated by it will be in line with or in the path of the finger to the other shuttle-releasing rod, whereby the latter will be moved so as to raise the spring-catch and release the shuttle. In the next movement backward of the lathe-frame the member of the heddle-frame carrying the rollers will have been moved into such position as to bring the other roller opposite to the elbow-arm of the shuttle-releasing rod now to be actuated, while the other roller will be moved out of the path of the other arm, and thus in alternation the two elbow-arms and the cams actuated therefrom will be active and inactive for the purpose of operating the shuttle-releasing rods. As soon as the lathe-frame moves forward and away from the heddle-frame the elbow-arm not in contact with its roller drops by gravity to its normal position, in which position the cam-block carried by the same is in the path of the finger on the shuttle-releasing rod. In the position of the parts illustrated in Figs. 1 and 2 of the drawings the cam 32 is in position where it has acted upon the finger 30, so as to draw back the rod 26 and release the shuttle, the other cam-block 33 on the shaft 35 having been moved out of the path of the finger 31 of the rod 27 by contact of its elbow-lever 37 with the roller 39, as indicated by dotted lines in Fig. 2. It will be observed that under the construction just described the rods 26 and 27 are in alternation drawn back longitudinally by contact of their respective swinging fingers with the cam-blocks 32 and 33, as the latter are permitted to be in the path of movement, one rod being retracted while the other rod is in its inward position. So long as the swinging fingers are in contact with the cam-actuating blocks the rods are in their withdrawn position, and as soon as the cam-blocks leave their operative position the rods are thrown inwardly by means of their respective springs 45 and 46, which may be of any suitable form, but which are illustrated as steel springs connected at one end to the shuttle-bar-reciprocating rods and at their other end bearing against the shuttle-releasing rods, the springs being placed under tension in the retracted position of the rods and exerting their tension to move the rods into their inactive position when the cam-blocks 32 and 33 in alternation are moved out of contact with the pendent fingers of the rods.



A loom having the parts formed as herein described is positive, direct, and regular in its movements and maintains uniform tension upon the parts and makes the loom very durable in use and the parts not so liable to get out of repair.

I have illustrated and described what I consider to be the preferred details of construction and arrangement of the several parts; but it is obvious that alterations can be made and the essential features of my invention be still retained.

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

1. In a shuttle-motion for looms, the combination of the reciprocating shuttle-bars, rods for transmitting motion to said bars, rotatable chain-receiving wheels connected with said rods, each wheel having a reduced portion opposite to its swell or cam surface, the reduced portion of one wheel being alongside the cam-surface of the other wheel, thus forming cam-shaped wheels substantially of the form shown having oppositely-disposed cam-surfaces, and chains connected with driving mechanism and attached one to each of said rotatable wheels, the cam-shaped wheels serving to take up slack and maintain a uniform tension on the chains, substantially as described.

2. In a shuttle-motion for looms, the combination of the loom-frame, the lathe-frame having a swinging connection with the loom-frame, rotatable chain-receiving wheels supported upon the lathe-frame, each wheel having a reduced portion opposite to its swell or cam surface, the reduced portion of one wheel being alongside the cam-surface of the other wheel, thus forming cam-shaped wheels substantially of the form shown having oppositely-disposed cam-surfaces, chains connected to said cam-shaped wheels so that when one chain is wound upon one wheel the other will be unwound from the other wheel, a crank-shaft to which said chains are attached, arms extending one from each of said cam-shaped wheels, reciprocating shuttle-bars, and rods connecting the arms of the cam-shaped wheels with the shuttle-bars, substantially as described.

3. In a shuttle-motion for looms, the com-

bination with the reciprocating shuttle-bars and shuttle-holding catches carried by the same, of the reciprocating rods for releasing the shuttle-catches, one rod to each shuttle-bar, pivoted fingers connected one to each of said rods, rotary shafts carrying cam-blocks adapted to be thrown into and out of the path of movement of the fingers to the releasing-rods, arms connected to said rotatable shafts, the heddle-frame, bearings carried by said frame and located so that in the swinging of the lathe-frame the arms of the rotatable shafts will be brought into engagement with said bearings in alternation so as to move the cam-blocks out of the path of the fingers to the releasing-rods, substantially as described.

4. In a shuttle-motion for looms, the combination with the swinging lathe-frame, the reciprocating shuttle-bars and shuttle-holding catches carried by the same, of the rods for releasing the shuttle-catches, one rod to each shuttle-bar, a block or member, one for each shuttle-releasing rod, adapted to be moved into the path of travel of a part of each of said shuttle-releasing rods for actuating the rod, an arm or lever operatively connected with said block or member, one for each block, and carried by the lathe-frame, and bearings for said arms or levers to alternately contact with in the swinging of the lathe-frame for actuating the lever, substantially as described.

5. In a shuttle-motion for looms, the combination with the swinging lathe-frame, the reciprocating shuttle-bar and shuttle-holding catch carried by the same, of the rod for releasing the shuttle-catch, a block or member adapted to be moved into the path of travel of a part of the shuttle-releasing rod for actuating the rod, an arm or lever carried by the lathe-frame and operatively connected with said block or member, and a bearing between which and said lever contact is alternately made and avoided in the swinging of the lathe-frame, substantially as described.

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

WILLIAM F. KINTZING.

Witnesses:

W. H. BURNHAM,  
C. B. SEITZ.