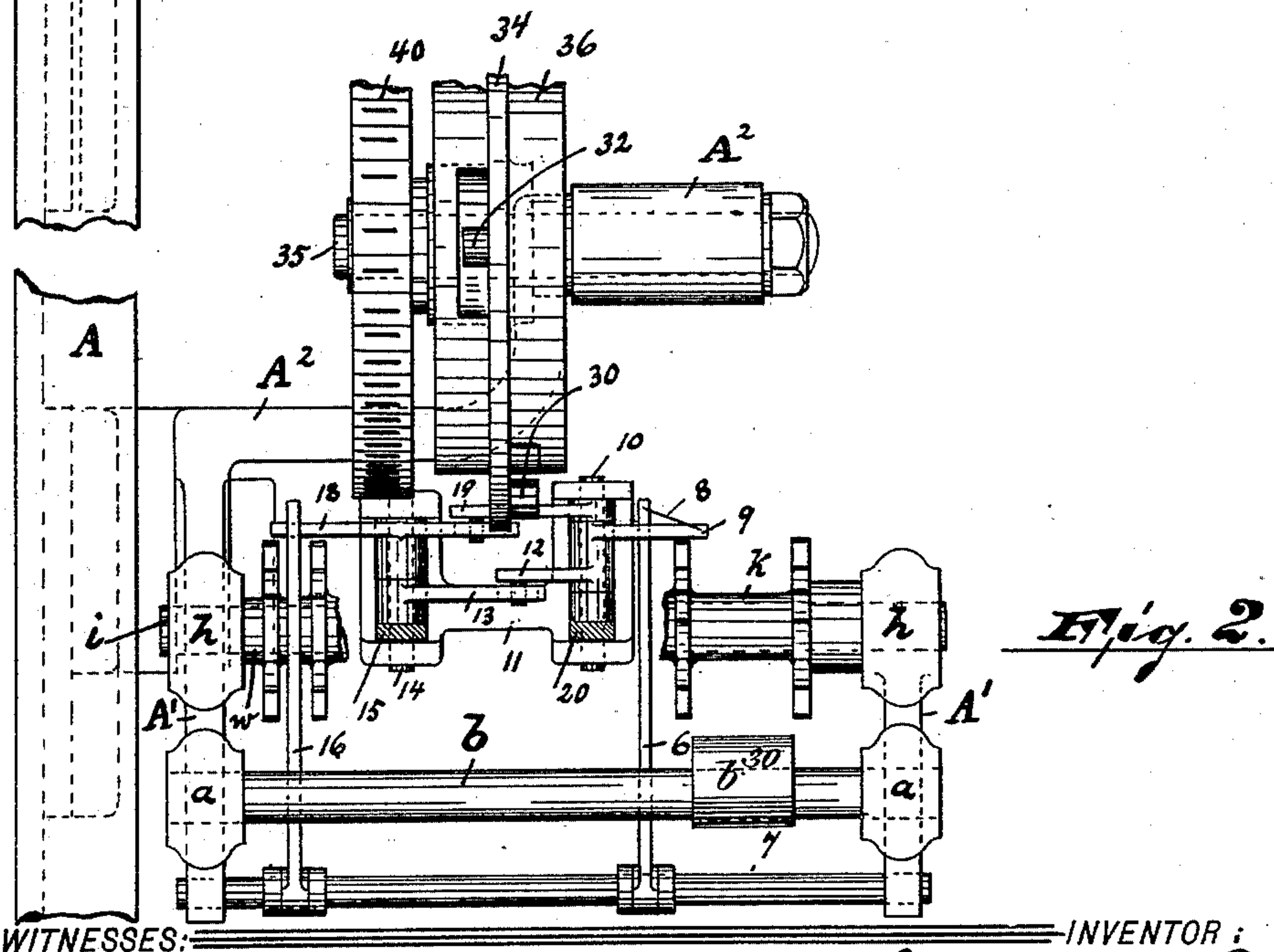
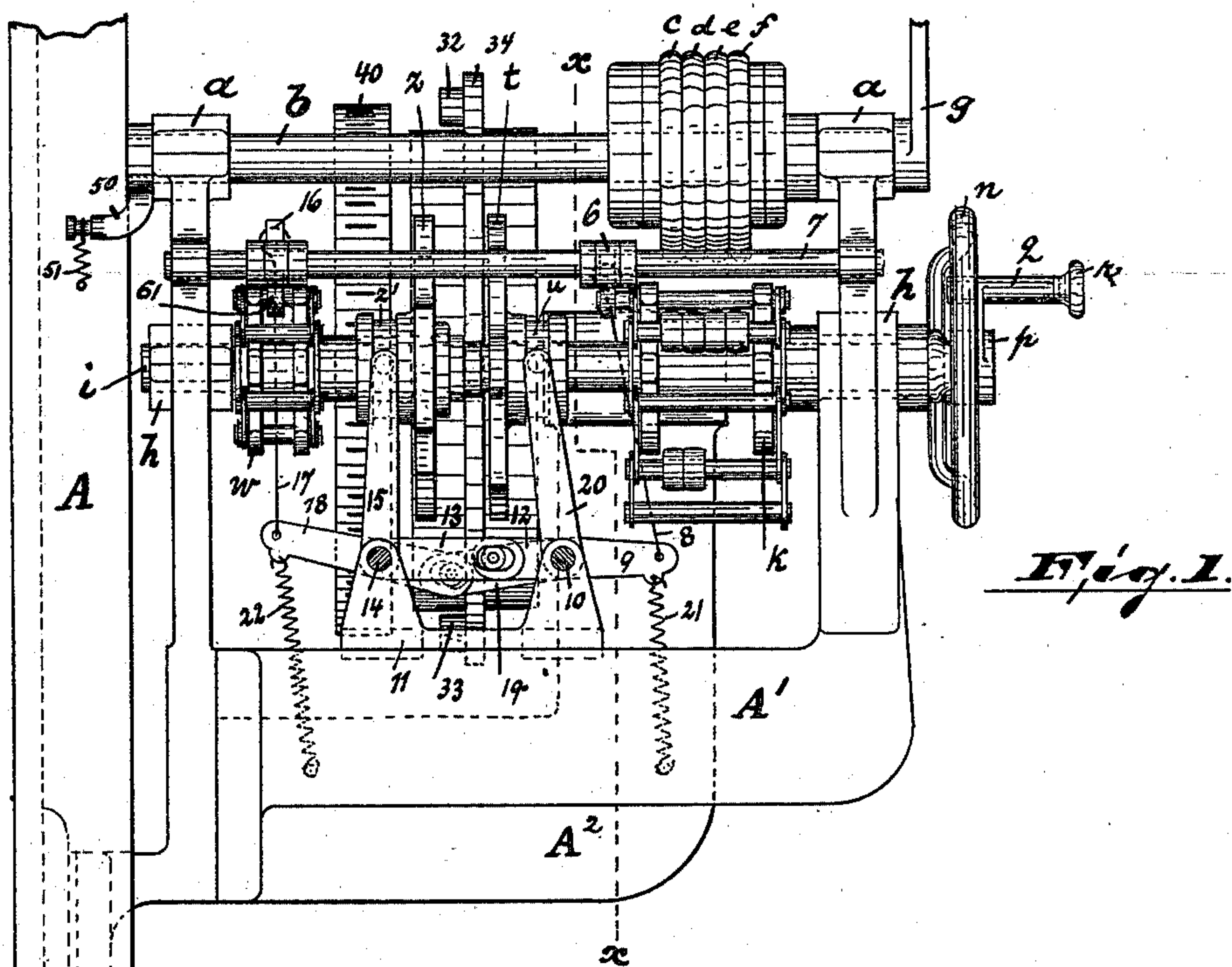


2 Sheets—Sheet 1.

# SHUTTLE BOX OPERATING MECHANISM FOR LOOMS.

Patented Nov. 28, 1893.



**WITNESSES:**

**-INVENTOR :**

Wm. Dill  
J. M. Robertson.

*James Eastwood*

BY *Gartner & Co*

**ATTORNEYS**

(No Model.)

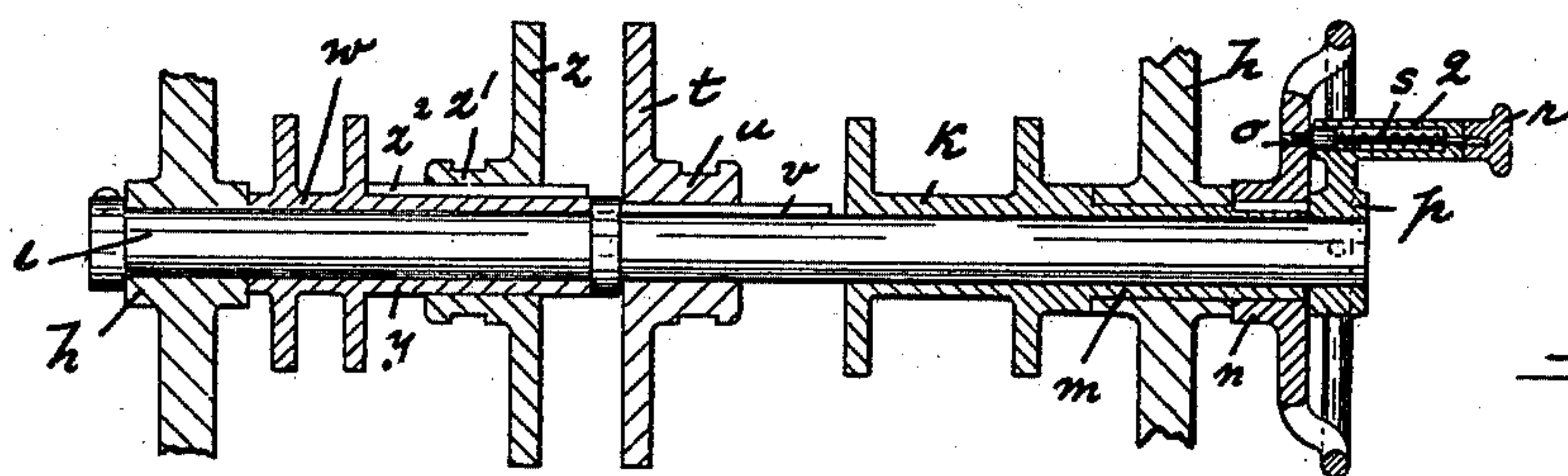
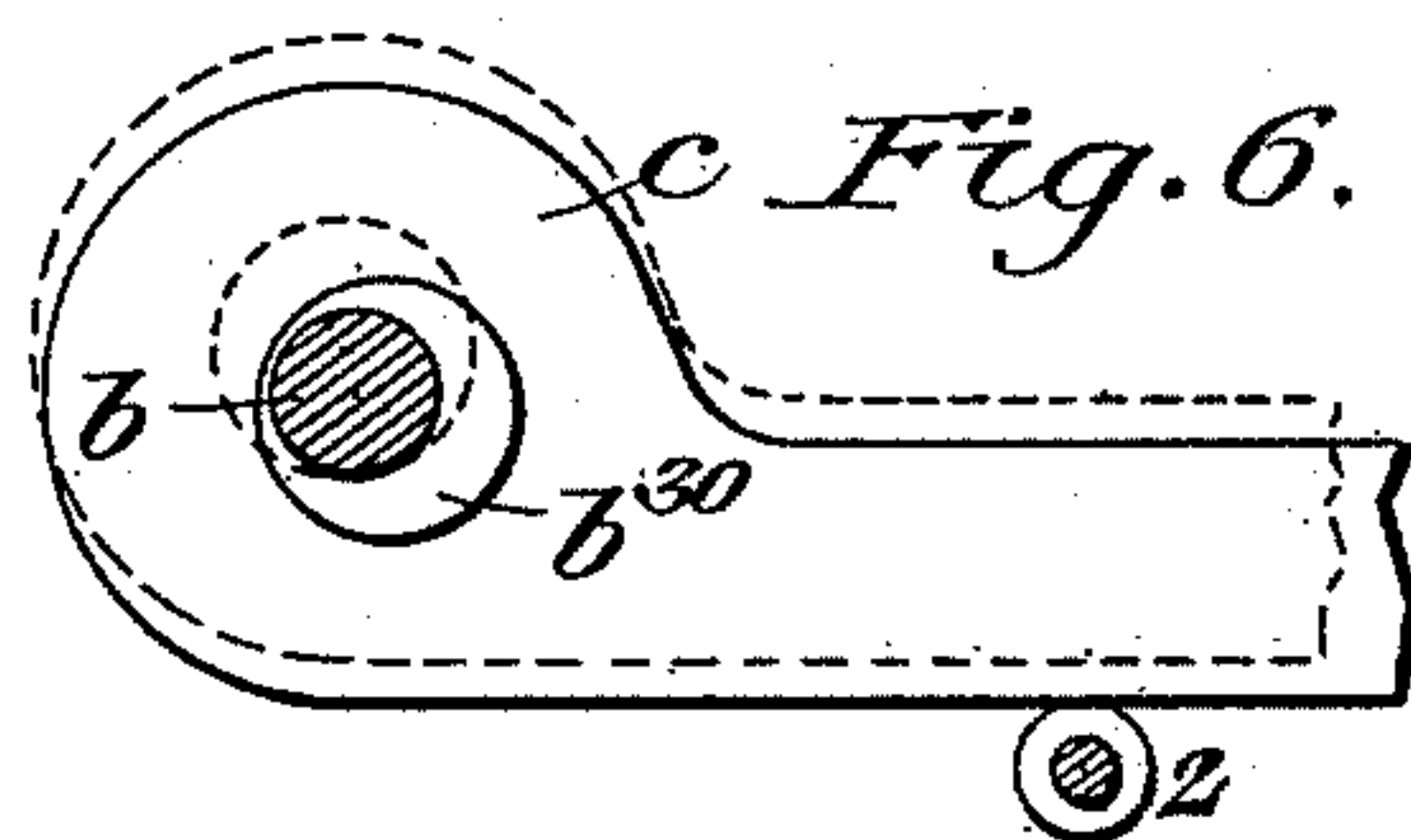
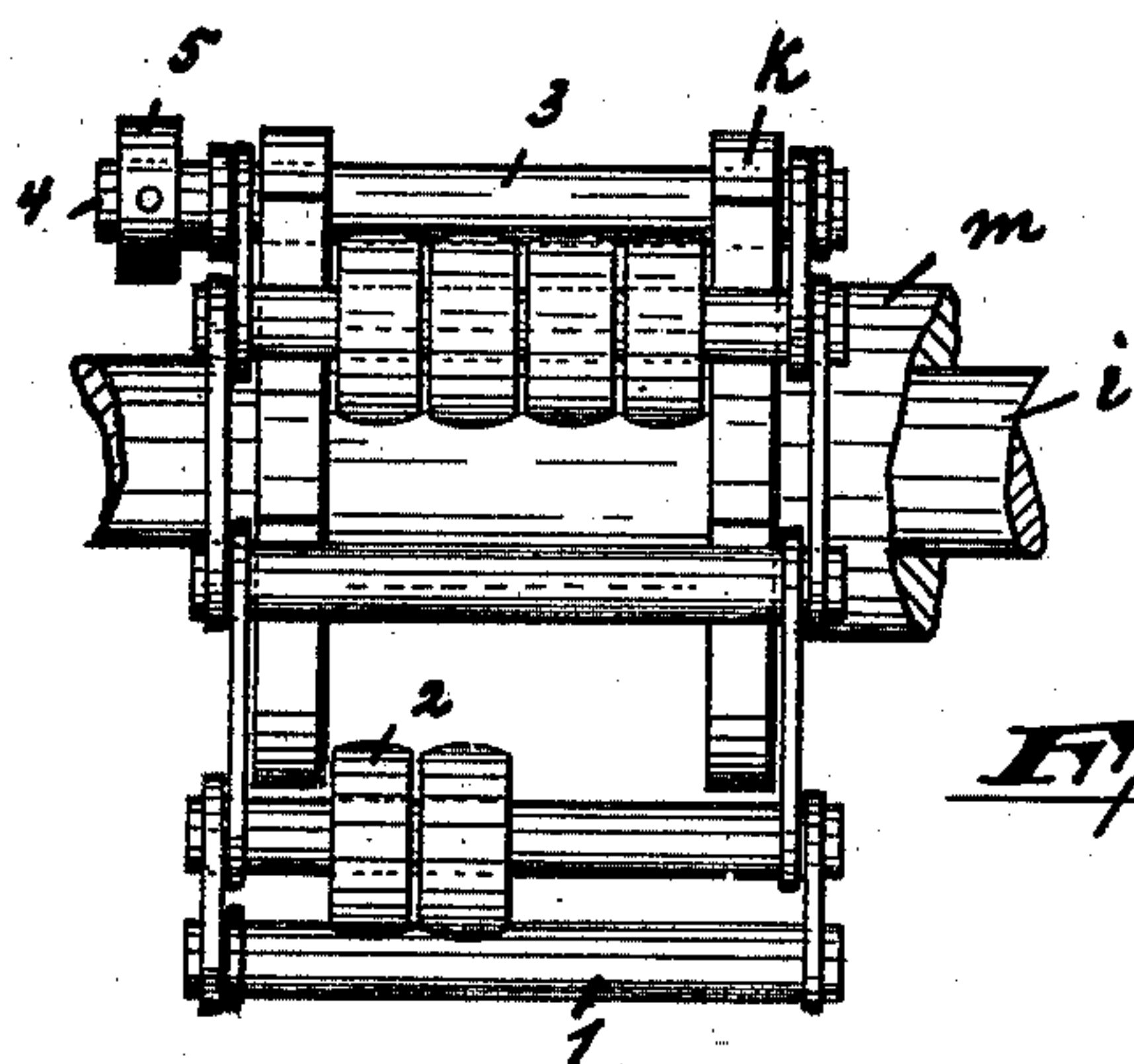
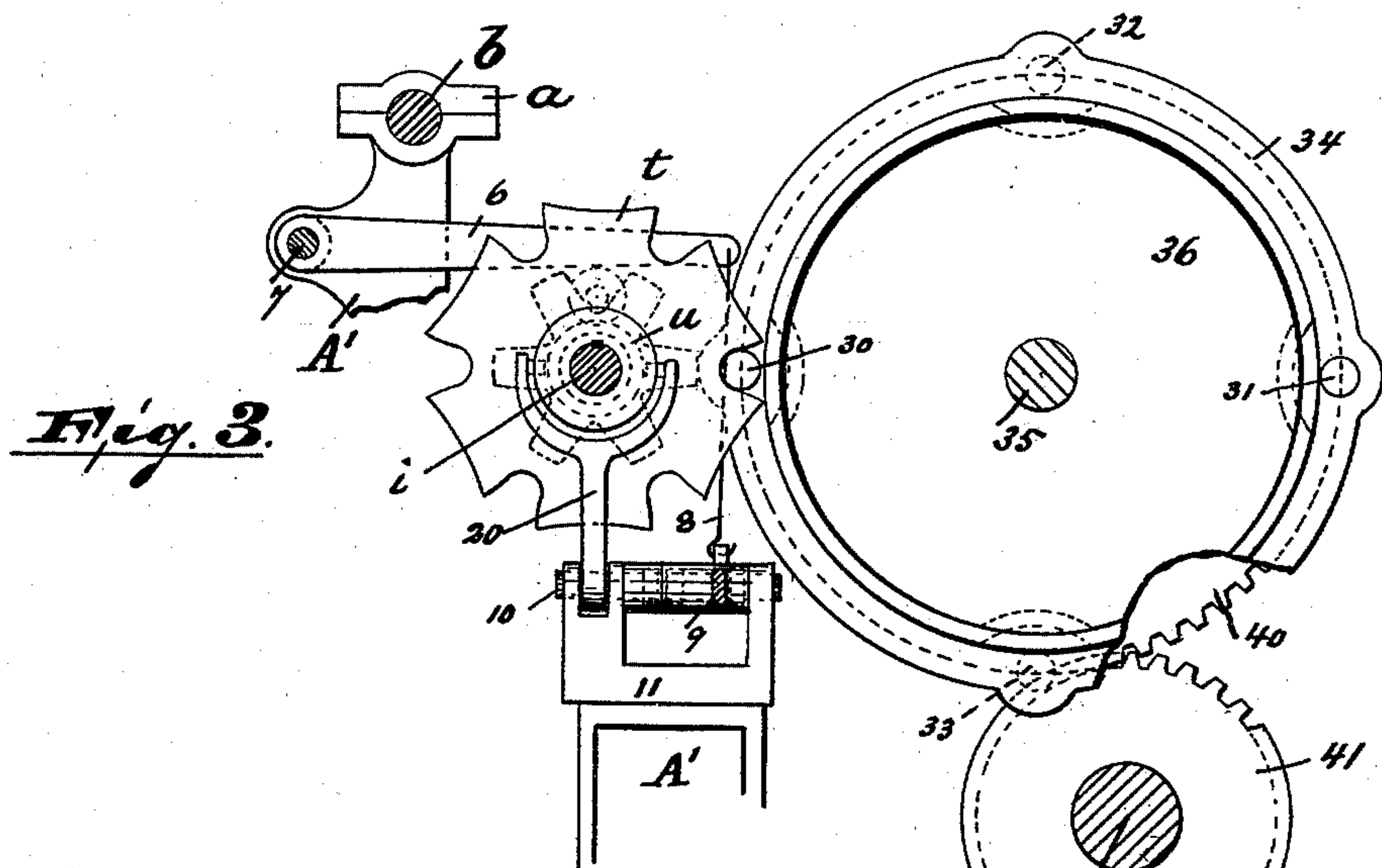
2 Sheets—Sheet 2.

J. EASTWOOD.

# SHUTTLE BOX OPERATING MECHANISM FOR LOOMS.

No. 509,615.

Patented Nov. 28, 1893.



**WITNESSES:-**

**-INVENTOR :**

Wm. D. Bell  
S. M. Robertson.

James Eastwood

BY *Gartner & Co*

**ATTORNEYS.**



# UNITED STATES PATENT OFFICE.

JAMES EASTWOOD, OF PATERSON, NEW JERSEY, ASSIGNOR TO BENJAMIN EASTWOOD, OF SAME PLACE.

## SHUTTLE-BOX-OPERATING MECHANISM FOR LOOMS.

SPECIFICATION forming part of Letters Patent No. 509,615, dated November 28, 1893.

Application filed March 9, 1893. Serial No. 465,270. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES EASTWOOD, a citizen of the United States, residing in Paterson, county of Passaic, and State of New Jersey, have invented certain new and useful Improvements in Shuttle-Box-Operating Mechanism for Looms; and I do hereby 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 letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to a new and useful improvement in mechanism for repeating certain picks in box looms, and it consists in the arrangement and combination of parts, whereby the shaft carrying the pattern chain is controlled in its revolution, so that one pick may be repeated.

It consists also in the combination and arrangement of parts hereinafter described and claimed.

The object of the present invention is to control the picks of the loom without using a long and cumbersome pattern chain.

My invention is illustrated by the drawings, in which—

Figure 1 is a side elevation of the improved attachment. Fig. 2 is a top plan view thereof, certain parts being removed. Fig. 3 is a detail sectional view taken on the line  $x-x$  of Fig. 1. Fig. 4 is an enlarged detail view of the pattern chain and its sprocket wheel. Fig. 5 is an enlarged detail view of the shaft, showing in section the various sprocket and star wheels carried thereby, and Fig. 6 is a detail sectional view through one of the levers  $c$  ( $d$ ,  $e$  or  $f$ ) and its shaft  $b$ .

In said drawings  $A$  represents a portion of the frame of the loom, from which project the brackets  $A'$  and  $A^2$ . The bracket  $A'$  is provided with bearings  $a$  for the shaft  $b$ , upon which the levers  $c$ ,  $d$ ,  $e$  and  $f$  controlling the shuttle changing mechanism are arranged in the usual manner, that is to say, they are arranged on an eccentric  $b^{30}$  on said shaft and can be brought out of engagement with the pattern chain by the handle  $g$ , as clearly shown in Figs. 1 and 6 of the drawings. The shaft  $b$

is held in its normal position by the spring 51, secured to the arm 50 on said shaft and also to the frame  $A$ . The bracket  $A'$  is also provided with bearings  $h$ ,  $h$ , for the shaft  $i$ , on which is loosely secured the sprocket wheel  $k$  carrying the pattern chain. (See Fig. 5.) Integral with the sprocket wheel  $k$  is the extending sleeve  $m$  to which the hand wheel  $n$  is keyed. This hand wheel  $n$  has in its spokes a series of holes or recesses  $o$  for the purpose hereinafter described.

Keyed to the end of the shaft  $i$  is a collar  $p$  provided with the handle  $q$ , in which is held the spring actuated pin  $s$ , operated by the knob  $r$ . This pin  $s$  is adapted to fit into the holes or recesses  $o$  in the hand wheel  $n$  and thus bind said hand wheel, sleeve  $m$  and sprocket-wheel  $k$  to the shaft  $i$  through the collar  $p$  and handle  $q$ .

Splined to shaft  $i$  as at  $v$  is a star wheel  $t$  (see Figs. 3 and 5) having integral therewith the grooved collar  $u$ . Loosely fitting on the shaft  $i$  is another sprocket wheel  $w$  having integral therewith the extending sleeve  $y$  on which, another star wheel  $z$  and its grooved collar  $z'$  are splined as at  $z^2$ . The sprocket wheel  $k$  carries the pattern chain consisting of the rods 1 and 3 (see Fig. 4), on some of which are secured the rolls or balls 2. One of the rods 3 is also provided with an outer extension 4, to which the roll 5 is secured for the purposes hereinafter specified.

In suitable bearings in bracket  $A'$  is placed the shaft 7, on which is pivoted the lever 6, connected at its free end by cord 8 to the arm 9 of a lever, loosely revolving around a shaft 10 having bearings in the bracket frame 11, secured to the bracket  $A'$  (see Figs. 1 and 2). The other arm 12 of said lever is toggled to the arm 13 secured to and adapted to rotate the shaft 14, also having its bearings in said bracket frame 11. Secured to said shaft 14 and extending upward at approximately right angles thereto is a forked lever 15, the forked end of which is adapted to slide the grooved collar  $z'$  and star wheel  $z$  on sleeve  $y$ . On shaft 7 is also pivoted a lever 16 connected at its free end by cord 17 to one arm 18 of a lever, loosely revolving on the shaft 14, the other arm being toggled to an arm 19 keyed to and adapted to rotate the



shaft 10. Extending upward from said shaft 10 and secured at approximately right angles thereto is an arm 20 provided with a forked end adapted to engage the grooved collar *u* of star wheel *t* and to shift the same on the shaft *i*. The arms 9 and 18 of their respective levers are normally depressed by the springs 21 and 22. The bracket A<sup>2</sup> furnishes a bearing for the shaft 35, on which is keyed the gear wheel 40 receiving motion from the gear wheel 41 secured to the main driving shaft M (see Fig. 3). Secured to the shaft 35 is also the wheel 36 having the central annular flange 34. On opposite sides alternately of this flange 34 are the pins or projections 30, 31, 32 and 33 adapted to fit into the recesses of the star wheels *t* and *z*, when said star wheels are shifted over on their shafts.

On the sprocket wheel *w* is placed a pattern chain, having on one or more of its rods a ball 61, normally adapted, when said chain is at rest to lie under the lever 16 and to raise the same. The roll 5 on projection 4 of the sprocket wheel *k* is adapted in rotation to pass under lever 6 and to lift the same. (See Fig. 3.)

The operation is as follows: The star wheel *t*, which is splined to shaft *i*, is normally held in engagement with the flanged wheel 36, the pin thereof fitting into one of the recesses, in the following manner. Lever arm 18 is normally held raised by ball 61, and this arm, through its toggle connection with arm 19 (secured to shaft 10) rocks said shaft 10 and the forked arm 20 secured thereto, and thereby slides said star wheel *t* and its collar *u* on shaft *i*, until the recesses of said star wheel come into engagement with one of the pins 30—31. In this manner motion is conveyed from the main driving shaft M through gear wheels 41 and 40 and flanged wheel 36 to the star wheel *t*, which in turn rotates shaft *i*. The shaft *i*, through collar *p*, handle *q*, pin *s* and hand wheel *n* rotates the sprocket wheel *k*, carrying the pattern chain. The levers *c*, *d*, *e* and *f* are thereby lifted according to the pattern, thereby actuating the respective parts of the shuttle changing mechanism to bring the required shuttle box in position, to throw its shuttle. The pattern chain continues to revolve, until one box is required for more than one pick, that is to say, one of said levers *c*, *d*, *e* and *f* is to be lifted and held in its raised position by the pattern chain, until the necessary picks or throws from the shuttle of the box, actuated from said lever, has been accomplished. At the required moment the ball or roll 5 on extension 4 of the pattern chain comes into contact with and raises lever 6. The cord 8 is pulled upward, elevating the arm 9 of the lever on shaft 10. The other arm 12 of said lever is thereby depressed and through its toggle connection depresses the arm 13 secured to shaft 14. Said shaft 14 is thereby rocked, actuating the forked arm 15, which slides, through grooved

collar *z'*, the star wheel *z* on sleeve *y* of the sprocket wheel *w*, until said star wheel *z* is brought into engagement through its recesses with one of the pins 32—33 of the flanged wheel 36. The sprocket wheel *w* is then rotated, through its connection with star wheel *z*, wheel 36, gear wheels 40 and 41 by the main driving shaft M. At the first instant of its rotation the ball 61 of the chain carried by said sprocket wheel *w*, which normally rests under the lever 16, is brought out of engagement therewith, thus allowing said lever 16 to drop, being drawn down by cord 17 attached to the arm 18 of lever on shaft 14, which arm is normally under the influence of the spring 22 which tends to depress it. The other arm of said lever is elevated and through its toggle connection with the arm 19 secured to shaft 10 elevates said arm 19 and rotates said shaft 10. The arm 20 carried by said shaft 10 is thus thrown over and through its forked clutch connection with collar *u* of star wheel *t* slides said star wheel *t* on its shaft *i* out of connection with the flanged wheel 36, and thereby stops instantly the rotation of the pattern chain. In this position the ball 5 rests under lever 6 keeping it elevated and thereby through the connection heretofore described keeping the sprocket wheel *w* in rotation. The lever *c*, (*d*, *e* or *f*) as required is kept in its raised position by one of the balls of the pattern chain, and hence the shuttle box changing mechanism operated by said lever, is kept in operation, allowing the required shuttle to throw successive picks as desired. The number of picks so desired is determined by the position of the balls 61 on the chain carried by sprocket wheel *w*, for, when said wheel and chain have been rotated as before described until said ball 61 comes again under lever 16, said lever 16 is elevated and through cord 17, arms 18 and 19, shaft 10 and forked arm 20, the collar *u* and star wheel *t* are shifted on shaft *i*, until the star wheel *t* comes into engagement with the pins 30, 31, of the flanged wheel 36. The pattern chain on wheel *k* is then rotated as before described and immediately the roll 5 passes from under lever 6, thus allowing said lever 6 to drop, by reason of the pressure exerted downward thereon through cord 8, arm 9 and spring 21. In this position the arms 12 and 13 are immediately elevated, the shaft 14 is thrown over, carrying with it the forked arm 15, which through the connection heretofore explained shifts star wheel *z* out of engagement with the flanged wheel 36, thus stopping instantly the rotation of sprocket wheel *w* and its chain, (when the ball 61 passes under the lever 16.) It will thus be seen, that when ball 5 rests under lever 6, the sprocket wheel *w* and its chain are instantly rotated, bringing the ball 61 from under lever 16, and thus instantly, through the connections heretofore described, stopping the rotation of sprocket wheel *k* and its chain, and the reverse action is so timed that when sprocket



wheel *k* is actuated by the raising of lever 16, the sprocket wheel *w* is instantly stopped in its rotation by the falling of lever 6. The sprocket wheel *k*, to remedy defective picks, may be rotated backward independently of its shaft *i*, by drawing the pin *s* out of hole *o* in the hand wheel *n* through knob *r*, and rotating the hand wheel, sleeve *m* and sprocket wheel *k* in the reverse direction.

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

The combination, in a loom, of a flanged wheel, provided with pins, means for driving the same, a shaft *i*, sprocket wheel *k* normally secured to said shaft, a pattern chain provided with an outwardly projecting ball 5 and carried by said sprocket wheel *k*, a star wheel *t* having grooved collar *u* splined to said shaft *i*, a second sprocket wheel *w* having a sleeve *y* integral therewith mounted loosely on said shaft *i*, a chain, having the ball 61, secured to and carried by said sprocket

wheel *w*, a star wheel *z* having grooved collar *z'* splined to said sleeve *y*, with a cord 8, arm 25 9, toggled arms 12, and 13, forked arm 15, a lever 6, adapted, when raised by the ball 5 of the pattern chain, on the sprocket wheel *k* to operate through cord 8, arm 9, and toggled arms 12 and 13 the forked arm 15, to shift 30 said star wheel *z* on the sleeve *y* into engagement with the pins of the flanged wheel, and with a lever 16, cord 17 arm 18, toggle arms 19 and forked lever 20, said lever 16 being adapted when raised by ball 61, to operate 35 through cord 17, arm 18 and toggle 19 the forked lever 20 to shift the star wheel *t* on shaft *i*, into engagement with the pins of the flanged wheel, substantially as described.

In testimony that I claim the foregoing I 40 have hereunto set my hand this 28th day of February, 1893.

JAMES EASTWOOD.

Witnesses:

ALFRED GARTNER,  
G. SUMNER SMITH.