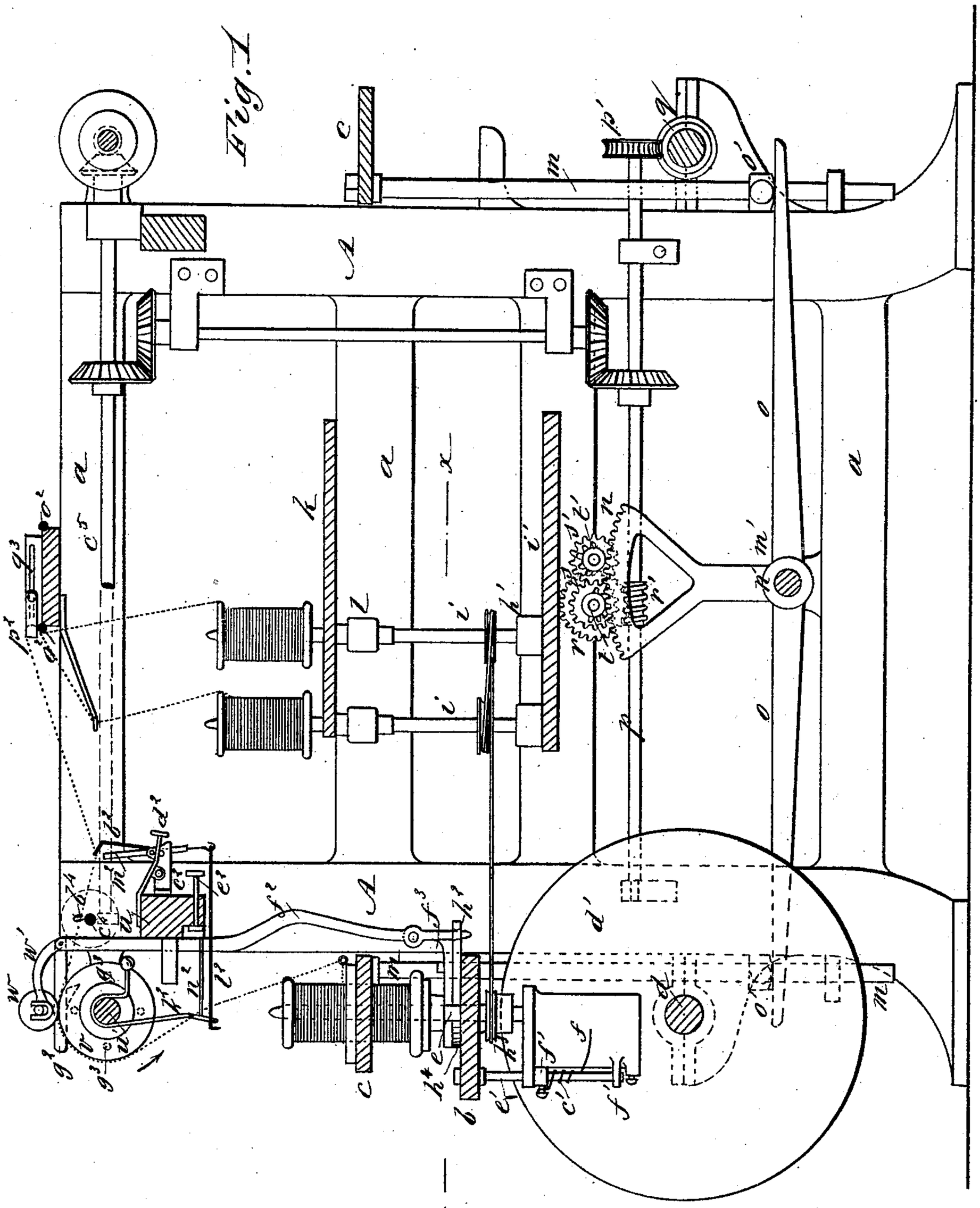
(No Model.) 2 Sheets—Sheet 1.

J. E. TYNAN.

SILK THROWING MACHINE.

No. 275,548. Patented Apr. 10, 1883.

Fig. 1.



WITNESSES:

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INVENTOR:

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(No Model.) 2 Sheets—Sheet 2.

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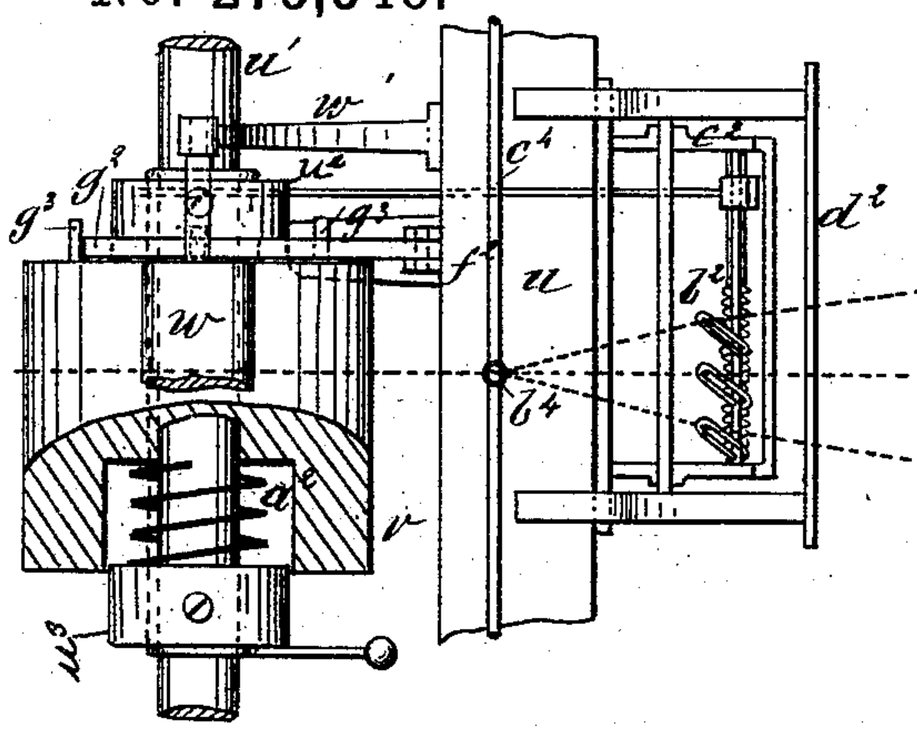
Fig. 1



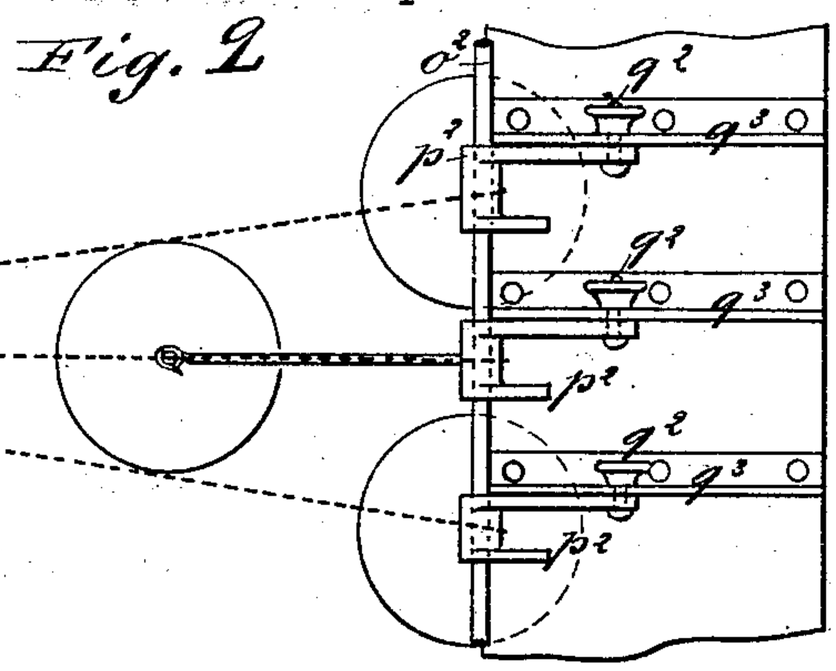


Fig. 2

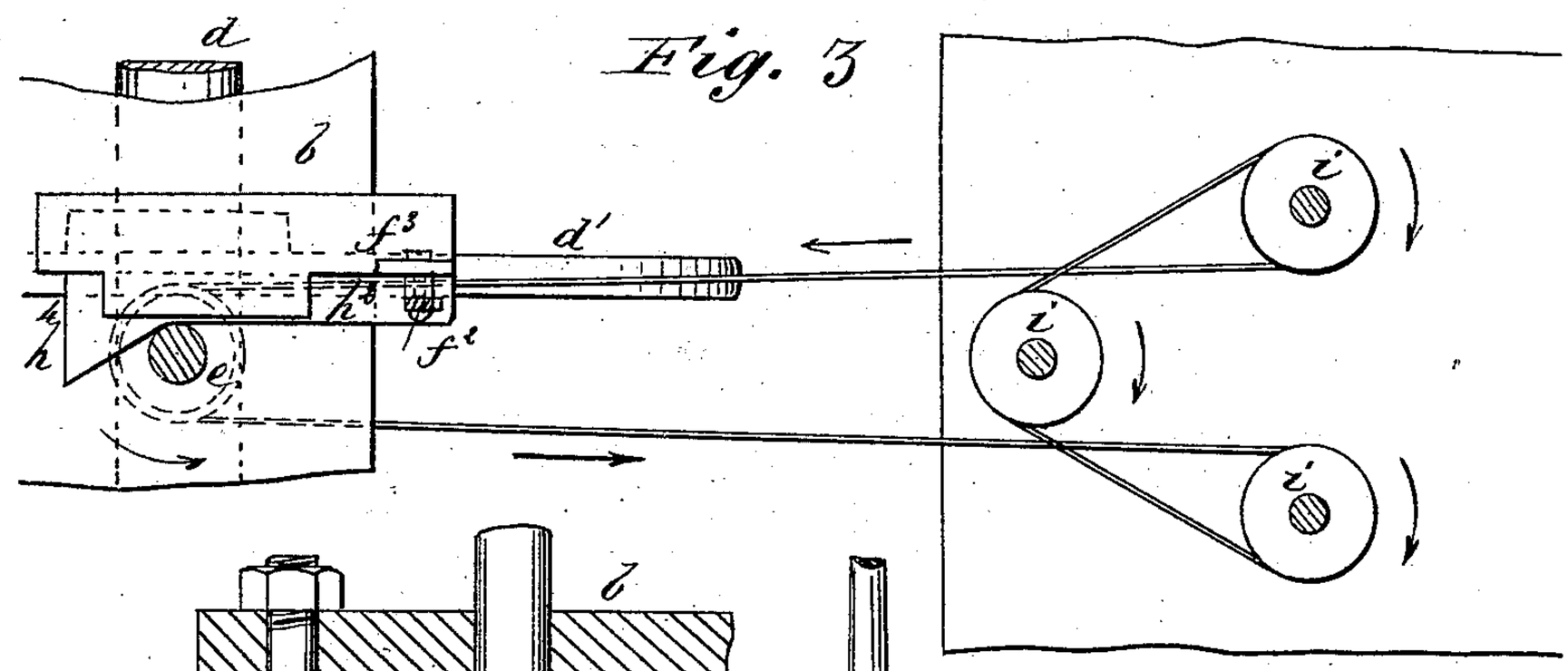


Fig. 4

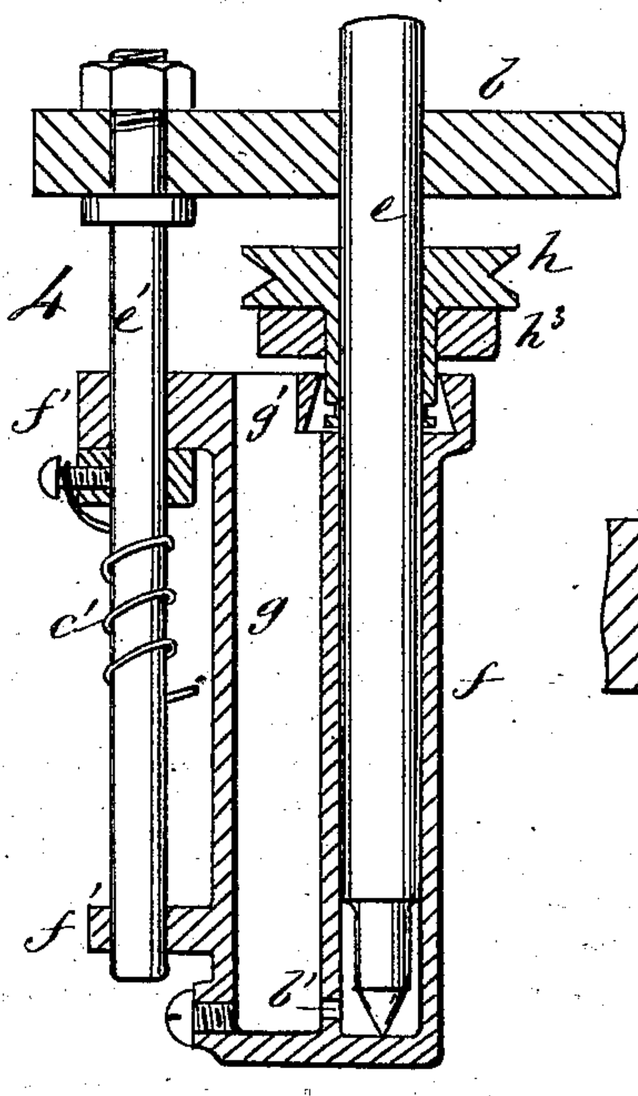


Fig. 5

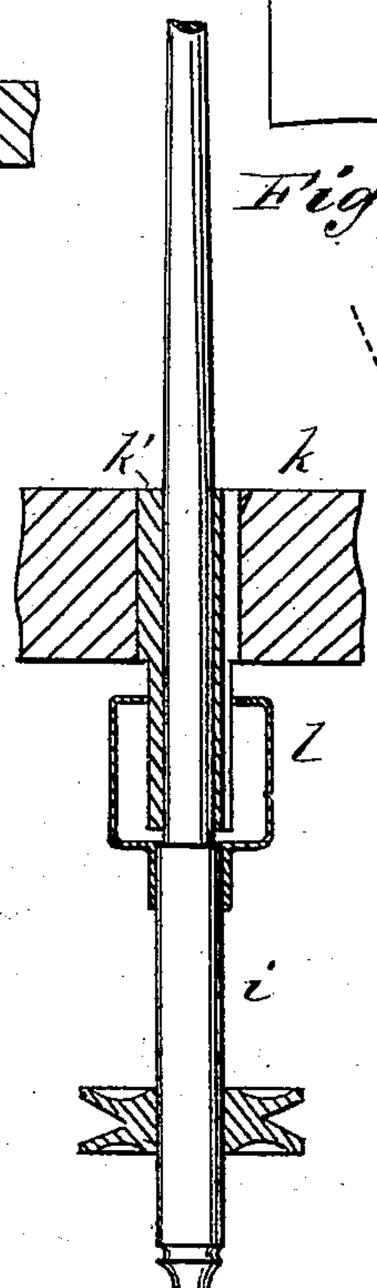
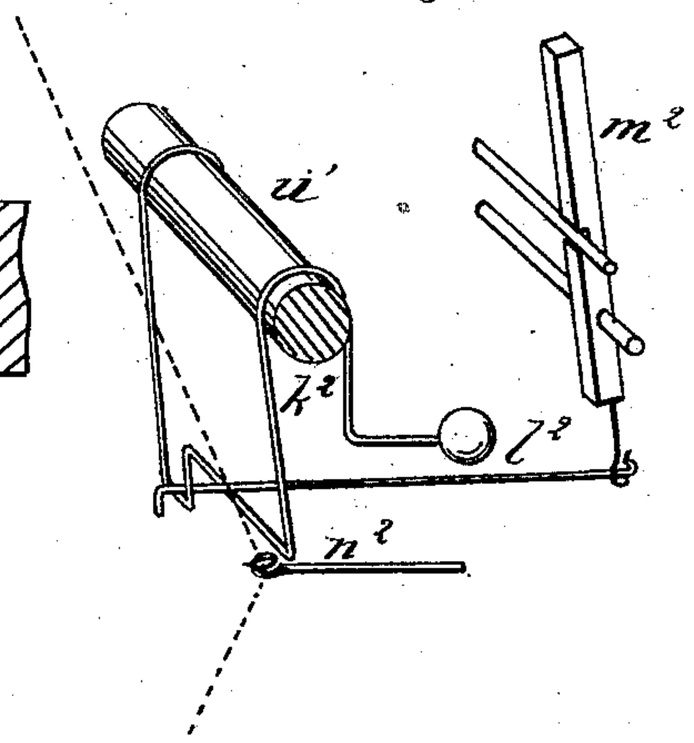


Fig. 6



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UNITED STATES PATENT OFFICE.

JOSEPH E. TYNAN, OF PATERSON, NEW JERSEY.

SILK-THROWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 275,548, dated April 10, 1883.

Application filed March 18, 1882. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. TYNAN, of Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Silk-Throwing Machines, of which the following is a full, clear, and exact description.

My invention relates to machines used to spin, double, and respin silk and other fibers by a continuous operation; and it consists in certain novel features of construction and arrangement hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a vertical transverse section of a spinning-machine with my improvements. Fig. 2 is a plan view, partially sectional. Fig. 3 is a horizontal section on line *x x*, Fig. 1. Fig. 4 is a detail section of the front spindle-bearings. Fig. 5 is a detail section, showing one of the rear spindles; and Fig. 6 is a detail view of the stop motion.

A A are the frame-standards of the machine, tied by end rails, *a*.

b is the step-rail, and *c* the ring-rail, of the front spindles.

d is the main shaft, carrying a friction-disk, *d'*, by which the spindles are driven.

e is a front spindle, stepped in a box, *f*, that is suspended beneath rail *b* by a pintle-rod, *e'*, that is fixed to the rail, the box *f* being formed with side lugs, *f'*, through which the rod passes, and the rod having a collar on which the upper lug, *f'*, rests. The box can be vertically adjusted, and may be swung to one side when the spindle is out. On the pintle *e'* is a spiral spring, *c'*, placed to move the box *f* inward. The step-box *f* is formed, as shown most clearly in Fig. 4, with two compartments—one in which the end of the spindle fits snugly and an oil-compartment, *g*, that opens by an aperture, *b'*, to the space around the lower end of the spindle. At the upper end of the box, and around the spindle, is fixed a beveled ring, *g'*, that forms a chamber to receive the oil carried up by the spindle, so as to prevent overflow and to conduct the oil back to the receptacle *g*. On the spindle, just above the box, is a grooved pulley, *h*, and a friction-pulley, h^3, driven by contact with the disk *d'*.

i i are the back spindles, stepped in boxes *h'* on a rail, *i'*, and extending through an upper rail, *k*. As shown in Fig. 5, the rail *k* is fitted with a bushing, *k'*, for each spindle, and the bushing extends below the rail into an oil-cup, *l*, fixed on the spindle, so that the bearing shall be kept lubricated by the oil which will work up into the bearing. These devices insure firm support of the spindles and lubrication of the bearings.

I provide for movement of the ring-rail *c* the mechanism as follows:

m is the lifting-rod, secured to the rail, and sustained in suitable guides on the frame of the machine.

n is a curved rack, sustained at the mid-width of the machine from a hub, *m'*, that is fixed on a rock-shaft, *n'*.

o is an arm extending sidewise from the hub *m'* to and beneath a collar, *o'*, on the lifting-rod *m*, there being also a similar arm extending to the back of the machine for operating the rods at that side.

p is a transverse shaft, carrying at the back of the machine a worm-wheel, *p'*, that is engaged by a worm on a shaft, *q*, which will be rotated by connections from the main shaft *d*.

r is a gear-wheel suitably sustained above the shaft *p*, and engaging a worm, *r'*, thereon.

s is a smaller gear-wheel, and *t* a mutilated gear, both on the shaft of the wheel *r*; and *s'* is a gear-wheel engaging wheel *s*, and having upon its shaft a mutilated wheel, *t'*. Both wheels *t t'* engage the rack *n* in their rotation; but they are fitted to engage alternately, and the gears *t t'* having rotation in opposite directions, the rack is moved first one way and then the other. This rocking movement of the rack by moving arms *o* up and down gives to the rails *c* the required traversing movement.

The feed and stop mechanism of the machine is sustained above the front spindle on a rail, *u*, and consists as follows:

v is a roller fitted loosely on a shaft, *u'*. *w* is a smaller roller, sustained by brackets, *w'*, so that it may bear on the upper side of roller *v*. One end of the roller *v* is recessed for the reception of a friction-spring, a^2, placed on a shaft, *u'*, between a collar, u^3, and the roller *v* on shaft *u'*, (see Fig. 2,) which by its pressure on the roller *v* forces the latter against the col-

lar w^2, and insures movement of the roller v with the shaft.

b^2 are the fallers, hung on a cross-bar of a bracket, c^2, that is attached on the back of rail u.

d^2 is a hammer pivoted on the bracket c^2 and weighted to rest, as shown in Fig. 1, with its arms on the rail w, and its head projecting behind the fallers.

e^2 is a pin fitted through the rail to slide horizontally, and with its inner end in position to be struck by the hammer.

f^2 is a rod pivoted to a support, f^3, on step-rail b, and extending upward behind the roller v.

g^2 is a hinged arm, extending horizontally from the upper end of rod f^2, at one end of roller v, and provided with a bevel projection, (shown in dotted lines in Fig. 1,) which is brought in contact with pins g^3 on the end of the roller when the rod f^2 is moved outward. The lower end of rod f^2 engages a slide, h^2, on rail b, and the slide has a beveled side lug, h^4, in contact with spindle e. The rod f^2 acts to stop the spindles and arrest the feed-roller when its upper end is moved out by the slide-pin e^2, which carries the lug on arm g^2 into the path of the pins on roller v. The rod is then drawn outward by the continued movement of the roller until the rod strikes the collar w^2 on shaft w' and the roller is stopped. The movement of rod f^2 at its lower end at the same time moves slide h^2 inward, and the lug h^4, bearing on the spindle e, swings the latter and carries its pulley h^3 from the disk, thereby stopping the spindle. The hinged step-box allows this swinging motion of the spindle, and the spring c' restores it to the original position as soon as the pressure is released. To start the feed-rollers and spindles, the outer end of arm g^2 is raised to clear the pins g^3 from the lug. The spring c' of the step-box immediately acts to restore the parts to their first position. The slide-pin e^2 is moved by the blow of hammer d^2, which is borne down by the fallers b^2 when the thread breaks at any point behind the feed-rollers.

I provide separate devices as follows (shown most clearly in Figs. 1 and 6) for moving the hammer when the thread slackens from any cause or breaks in front of the feed-rollers:

k^2 is a wire loop suspended on shaft w'. l^2 is a wire resting by its outer and hooked end on loop k^2, and connected at its inner end to a faller, m^2, that is pivoted on the faller-bracket c^2. The wire loop k^2 is weighted to swing outward, and thereby draw on wire l^2 and turn the faller down on the hammer. The loop is held back normally, and the faller m^2 held up by the thread which passes in front of the loop through a fixed guide, n^2. The threads pass from the bobbins on the rear spindles to a glass rod, o^2, and tension devices p^2 above, from thence through eyes on the fallers b^2, through the doubling-hook b^4, over roller v, and then through the guide n^2 to the traveler on the ring-rail and the bobbins of the front spindles. Each thread has a separate tension device, p^2, which, as shown in Figs. 1 and 2, consists of a block pivoted by an arm and set-screw, q^2, to a fixed support, q^3, so that the block rests upon the rod o^2. The threads pass over the rod beneath the block, and then over the block to the front, so that the weight of the block and the friction on the surface gives the required tension. The tension can be varied by adjusting the set-screw q^2 in the support q^3, so as to make the block bear more or less on the glass rod. The doubling-hook b^4 is upon a rod, c^4, that is fitted to move endwise, and is moved by suitable connections so as to traverse the doubled threads on the feed-roller. This prevents the threads from wearing a groove in the roller. The rod c^4 is moved by an eccentric on the operating-shaft c^5 of the feed-rollers, or by any other suitable connections.

This tension device is applicable to any spinning-machine, and I do not limit myself in that respect; nor do I limit myself to any of the details of construction as described.

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

1. The combination, with the rail b, the disk d', the friction-pulley h^3, and spindle e, of box f, provided with the lugs f', the pintle e', and the spring c', substantially as described, and for the purpose set forth.

2. The combination, with the rail b and the hinged box f, of the slide-bar h^2, provided with the lug h^4, the spindle e, the pivoted rod f^2, and mechanism, substantially as described, for operating said rod, as and for the purpose set forth.

3. The combination of feed-roller v, provided with pins g^3, with the pivoted rod f^2, having arm g^2, slide e^2, pivoted hammer d^2, and fallers b^2, substantially as described, for operation as set forth.

4. The combination, with the shaft w' and faller m^2, of the weighted suspended hook k^2, the rod l^2, and the guides n^2, substantially as and for the purpose set forth.

5. The combination, with the support q^3, of the adjustable pivoted tension-block p^2 and rod o^2, substantially as and for the purpose set forth.

6. The combination, with the lifting-rods m, the arm o, the rocking rack n, the shaft p, and worm r', of the gear-wheels r s s', and the mutilated gears t t', substantially as described, and for the purpose set forth.

7. The combination, with the shaft w', provided with the collars w^2 w^3 and the spring a^2, of the feed-roller v, substantially as and for the purpose set forth.

JOSEPH E. TYNAN.

Witnesses:
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C. SEDGWICK.