(No Model.)

J. E. TYNAN.

MACHINE FOR THROWING SILK.

No. 326,531. Patented Sept. 15, 1885.

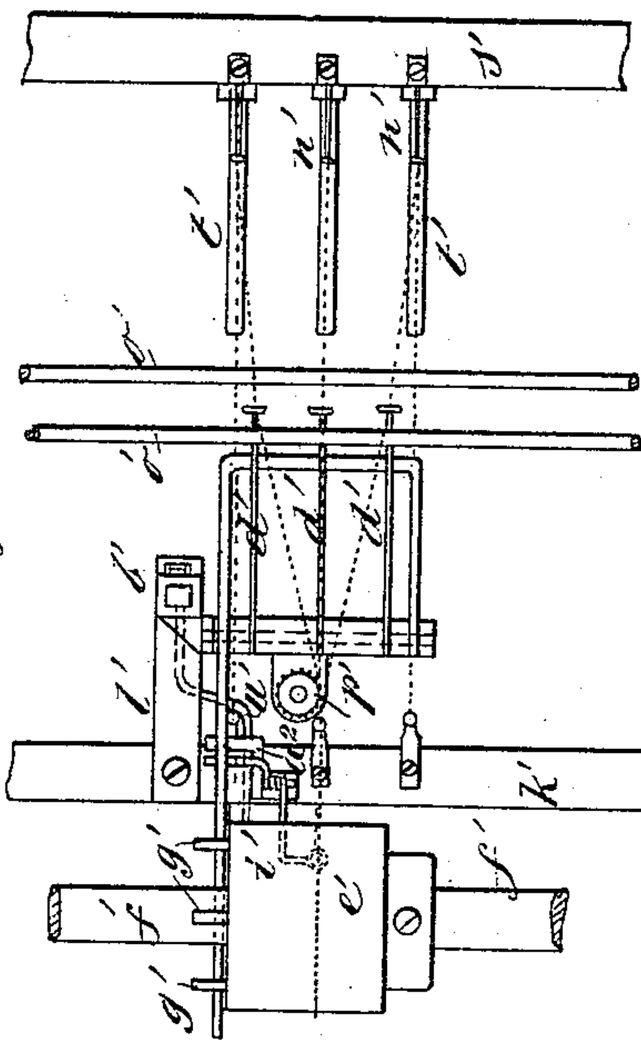

Fig. 2.

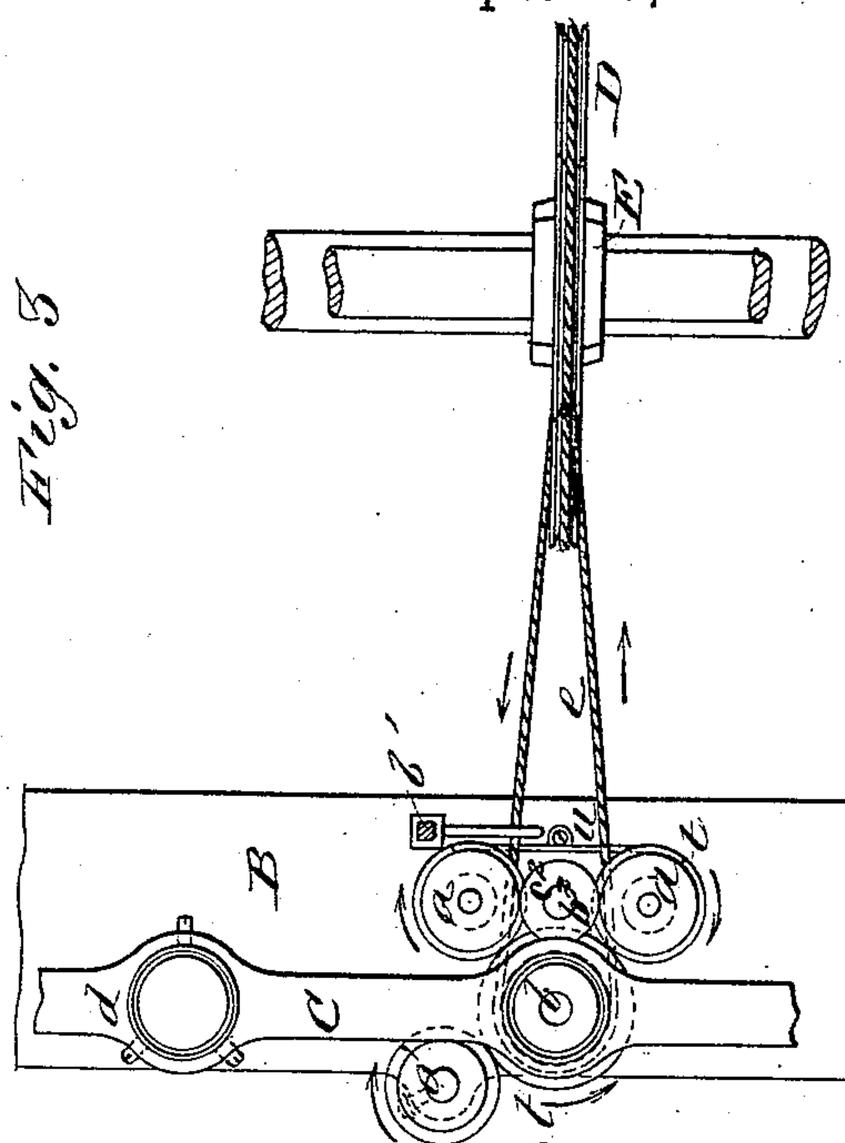

Fig. 3.

Fig. 1.

Fig. 4.

WITNESSES:

C. Neveux

C. Sedgwick

INVENTOR:

J. E. Tynan

BY Munn & Co

ATTORNEYS.

UNITED STATES PATENT OFFICE.

JOSEPH E. TYNAN, OF PATERSON, NEW JERSEY.

MACHINE FOR THROWING SILK.

SPECIFICATION forming part of Letters Patent No. 326,531, dated September 15, 1885.

Application filed August 24, 1882. Renewed October 27, 1884. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. TYNAN, a citizen of the United States, residing at Paterson, in the county of Passaic and State of New Jersey, have invented certain new and useful Improvements in Machines for Throwing Silk, of which the following is a specification.

My improvements relate to machines for throwing silk, in which the single threads are twisted, doubled, and respun by a continuous operation.

The invention consists in certain novel features of construction in the mechanism for driving the spindles, and in the stop-motion for arresting the movement of the spindles in case the thread breaks, as hereinafter described and claimed, reference being had to the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a vertical transverse section of a part of a silk-throwing machine of my improved construction. Fig. 2 is a partial plan view showing the stop mechanism. Fig. 3 is a horizontal section on the line *x x*, Fig. 1. Fig. 4 is a detail vertical section showing the means for oiling the main spindle and loose pulley.

A represents a portion of the main frame of the machine. B is the spindle-rail, and C is the ring-rail.

a a are the first-time or back spindles. *b* is the ring or main spindle; D, the main driving-pulley, to the shaft of which power is to be communicated by any suitable connections for rotating the pulley; and E is a smaller pulley, fitted on a shaft above the pulley D. *e* is the driving cord or belt passing around the two pulleys D and E, and to the pulley *f* of the ring-spindle *b*.

The construction of the spindle *b* and its bolster and loose pulley is shown in Fig. 4, and is as follows: The spindle is stepped within the bolster *g*, by which the spindle is sustained in an upright position. Upon the spindle, above the bolster, is a collar or flange, *i*, that is made with a depending barrel, *k*, that extends downward and around the bolster *g*, but not in contact therewith, and the lower end of this barrel *k* is slightly enlarged to form the fast pulley *f* of the spindle. The upper edge of this enlargement is still further diametrically extended, forming a flange, to which a friction-pulley, *t*, is secured. Below the tight pulley *f* is a loose pulley, *l*, provided with a sleeve, *m*, which is fitted for turning freely upon the bolster, this sleeve being used in order to give a longer bearing for the loose pulley. The upper part of the loose pulley *l* is recessed, and at the bottom of the recess are openings *n*, that communicate with the oil-cup *o*, formed in the bolster *g*. The loose pulley extends down into the oil-cup and rests on a shoulder formed on the bolster. This oil-cup *o* has a side aperture, *p*, for use in supplying oil to the cup, and is also formed with an aperture, *q*, for conveying oil to the step of the spindle *b*.

In operation the oil will work up between the spindle *b* and the bolster *g*, and, passing over the upper end of the bolster, will pass downward again through passage *h*, between barrel *k* and bolster *g*, to the cavity in the loose pulley *l*, and thence through opening *n* into the oil-cup *o*, so that all the bearing-surfaces will be continuously supplied with oil. When the loose pulley is set in motion, the oil will work up between the bolster *g* and the sleeve *m* until it reaches the top of the sleeve *m*, when it will be thrown by centrifugal force against the tapered inner sides of the loose pulley, and then will return to the oil-cup.

The bolster *g* is attached to the rail B by a nut, as shown at *r*, beneath the rail, and in order to relieve the rigidity of the attachment a spring-washer, *s*, is placed between the nut *r* and the rail.

The apertures in the rail B for receiving the bolsters of the back spindles are beveled, as shown in Fig. 1, in order to allow a sidewise tilting movement of the spindle, for purposes hereinafter described.

The rear spindles, *a a*, and their bolsters are similar to the ring-spindle *b* and its bolster just described, excepting that the fast pulley *f* and the loose pulley *l* are dispensed with in the case of spindles *a a*, and their barrels *k* are extended down into the oil-cups of the bolsters. The spindles *a a* are driven from the ring-spindle *b* by friction. For this purpose the barrels *k* on the several spindles are fitted with friction-pulleys *t*, the pulley on the ring-spindle being preferably made of hard rubber, in order to increase the friction.

The pulleys on the back spindles are maintained in contact with the rubber pulley by means of a spring, *u*, which bears upon the oil-cups *o* of the bolsters of the spindles *a a*. This construction insures the rotation of the three spindles, and the rear spindles being capable of a side tilting movement, the automatic adjustment and proper contact of the friction-pulleys is insured.

When a third thread is to be used, an additional spindle will be provided, as shown at *a'*, at one side of the front spindle, *b*, and this spindle will be provided with a friction-pulley, as above described.

The stop mechanism is as follows: *b'* is the stop-motion rod, fitted at its lower end with pins above and below the belt *e*. *c'* is a lever pivoted on the upper end of the rod *b'*. *d' d'* are the fallers pivoted on the upper end of the rod *b'*, and extending above the rear end of the lever *c'*. *e'* is the feed-roller, sustained on the frame A by a shaft, *f'*, above the outer end of the lever *c'*. This feed-roller is provided at one end with projecting pins *g'*, which are adapted to come in contact with a lug, *h'*, on the outer end of the lever *c'*, in the manner hereinafter described.

i' is a faller pivoted at the front of the machine to a post, a^2, on rail *k'*, and the faller *i'* has its upper end bent to extend beneath the lever *c'*.

l' is a piece projecting from the rail *k'* and apertured at its outer end to allow the passage of the stop-motion rod *b'*, and said rod *b'* is notched to engage in the side of the aperture of the piece *l'*, whereby the stop-motion rod *b'* is suspended in its elevated position and the belt retained upon the fast pulley of the spindle *b*. The lower end of the stop-motion rod *b'* is guided by passing through the rail B, and is provided with a collar, b^3, to rest on the said rail when it is released from the piece *l'* and the driving-belt has been shifted to the loose pulley *l* of the spindle *b*.

The thread passes from the bobbins on the back spindles, *a*, through guide-eyes *m'*, attached to the rail *k'*, then through the rear guide-eyes, *n'*, attached to the tram-board *s'*, and thence over rods *o'*, through the eyes of the fallers *d'*, then to and around a vertical doubling-roller, *p'*, mounted in a bracket at the top of the stop-motion rod *b'*, where the threads unite, then over and around the feed-roller *e'*, and through the eye of the faller *i'* to the traveler on the ring *d*, and thence to the bobbin on spindle *b*.

The lever *c'* is balanced to retain the horizontal position shown, with its lug *h'* out of contact with the pins *g'* of the feed-roller; but in case either thread breaks at any place behind the feed-roller its faller *d'* will be released, and the weight of the faller coming upon the rear end of the lever *c'*, the lug *h'* will be thrown upward into the path of the pins *g'*, and the pins *g'*, coming in contact with the lug *h'*, will carry the lever *c'* and the stop-motion rod *b'* backward, thereby freeing the rod from its engagement with the piece *l'* and allowing the rod to drop down. The downward movement of the rod will carry the belt upon the loose pulley *l* of the spindle *b*, and the movement of the spindles will be arrested. The same effect takes place by the slackening or breaking of the double thread in front of the feed-roller *e*. The fallers *i'* in that case being relieved, its rear end carries the forward end of the lever *c'* upward, thereby moving the lug *h'* into position to engage the pins *g'*.

The stop-motion rod *b'* is fitted with a spring, *r'*, which, entering the aperture of the piece *l'* when the rod is raised, acts to retain the rod in engagement with the piece *l'*.

At *s'* is a tram-board provided with pins *t'*, which are for receiving the bobbins when the single threads do not require to be twisted, as in the manufacture of what is known as "tram," the back spindles, *a*, in that case not being required for use.

In order to prevent the stop-motion rod *b'* from turning, it is provided with a projecting arm, *u'*, extending at one side of the post a^2, that supports the faller *i'*. This post a^2 serves to sustain the lever *c'* and the lug *h'* in contact with the feed-roller when the stop-motion rod *b'* falls, and also as a fulcrum for the lever when the outer end of the latter is pressed down to raise the rod again to its place.

The feed-roller *e'* is attached to its shaft *f'* by friction devices similar to those shown in a patent, No. 275,548, issued to me April 10, 1883, such friction connections allowing motion of shaft *f'* independently of the roller when the roller is arrested by the lever *c'*.

The shaft *f'* is revolved by any usual means, as by the worm and gear D^4, communicating by means of shaft D^3 and gears D^2 with the shaft of pulley D. Upon the rail B is a post, b^2, placed between the friction-pulleys, and having a cap, c^2, that projects over the pulleys. This serves to prevent the spindles from being raised by the act of removing the bobbins.

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

1. The combination of the spindle *b*, provided with the flange or collar *i*, the barrel *k*, and the fast pulley *f* with the recessed loose pulley *l* and the bolster *g*, formed with the oil-cup *o*, substantially as shown and described.

2. The combination, with the front spindle, *b*, provided with pulley *t*, of the rear spindles, *a a*, provided with friction-pulleys *t*, substantially as shown and described.

3. The combination, with the spindles *b* and *a*, provided with the friction-pulleys *t* and the bolsters *g*, of the rail B, formed with tapering or enlarged holes for the reception of the bolsters of the rear spindles, *a*, the nuts *r*, spring-washers *s*, and means, substantially as specified, for keeping the friction-pulleys of spindles *a* in contact with the friction-pulley of spindle *b*, as described.

4. The combination of the stop-motion rod

b', the frame A, the piece l', the lever c', with its lug h', the fallers d', the feed-roller e', provided with pins g', and means for operating said roller, the spindle b, provided with a tight pulley, f, and loose pulley l, the band e, the spindles a, and means for communicating motion to them from spindles b, as described.

5. The combination of the faller i', lever c', feed-roller e', provided with pins g, and means for revolving said roller, with the frame A, piece l', stop-motion rod b', the band e, the spindle b, having tight pulley f and loose pulley l, and the spindles a and b, having friction-pulleys, as set forth, all as shown and described.

6. The stop-motion rod b', the doubling-roller p', the lever c', and the fallers d', combined with the feed-roller e', provided with pins g, and means for operating said roller, the spindles a and b, with their friction-pulleys, as described, the said spindle b having the fast pulley f and loose pulley l, as set forth, the band e, frame A, and the piece l', as shown and described.

7. The frame A, piece l', and standard a^2, in combination with lever c', stop-motion rod b', feed-roller e', provided with pins g', and means for operating said roller, the fallers i' d', the spindles a and b, provided with friction-pulleys t, the tight and loose pulleys on spindles b, and the band e, as shown and described.

8. The post b^2, provided with cap c^2, combined with spindles a and b, having the pulleys t, substantially as and for the purpose specified.

9. The ring-spindle b, the rear spindles, a, the ring-rail, the feed-roller e', and means for operating the spindles and roller, in combination with devices, substantially as described, for stopping the spindles and feed-roller when a thread breaks, as described.

10. The combination, with spindle-bolster, of the loose pulley consisting of the sleeve or hub portion m, which fits closely on said bolster, and the band part l, which is rigidly connected with said sleeve and recessed and provided with holes n, as shown and described, and for the purpose specified.

11. The loose pulley consisting of the upper enlarged portion, l, having the hub or sleeve m, which is rigidly connected therewith, said part l being recessed or made hollow, as shown and described, and for the purpose specified.

JOSEPH E. TYNAN.

Witnesses:
GEO. D. WALKER,
C. SEDGWICK.