(No Model.) 2 Sheets—Sheet 1.

J. E. TYNAN.

MACHINE FOR THROWING SILK.

No. 261,409. Patented July 18, 1882.

Fig. 4

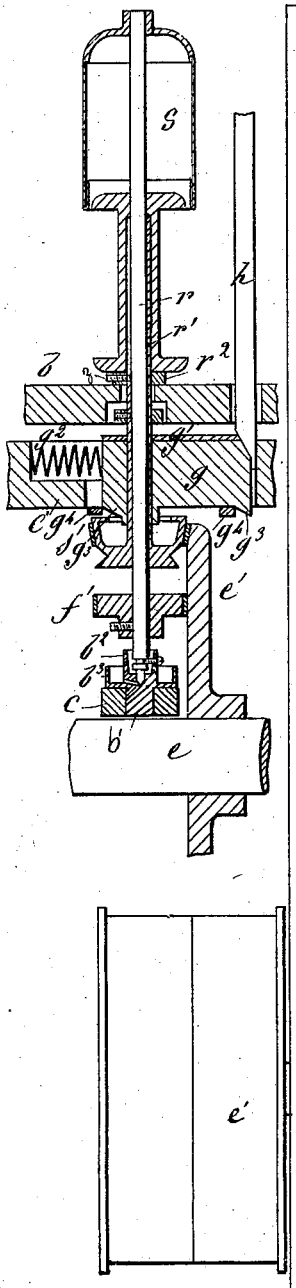

Fig. 1

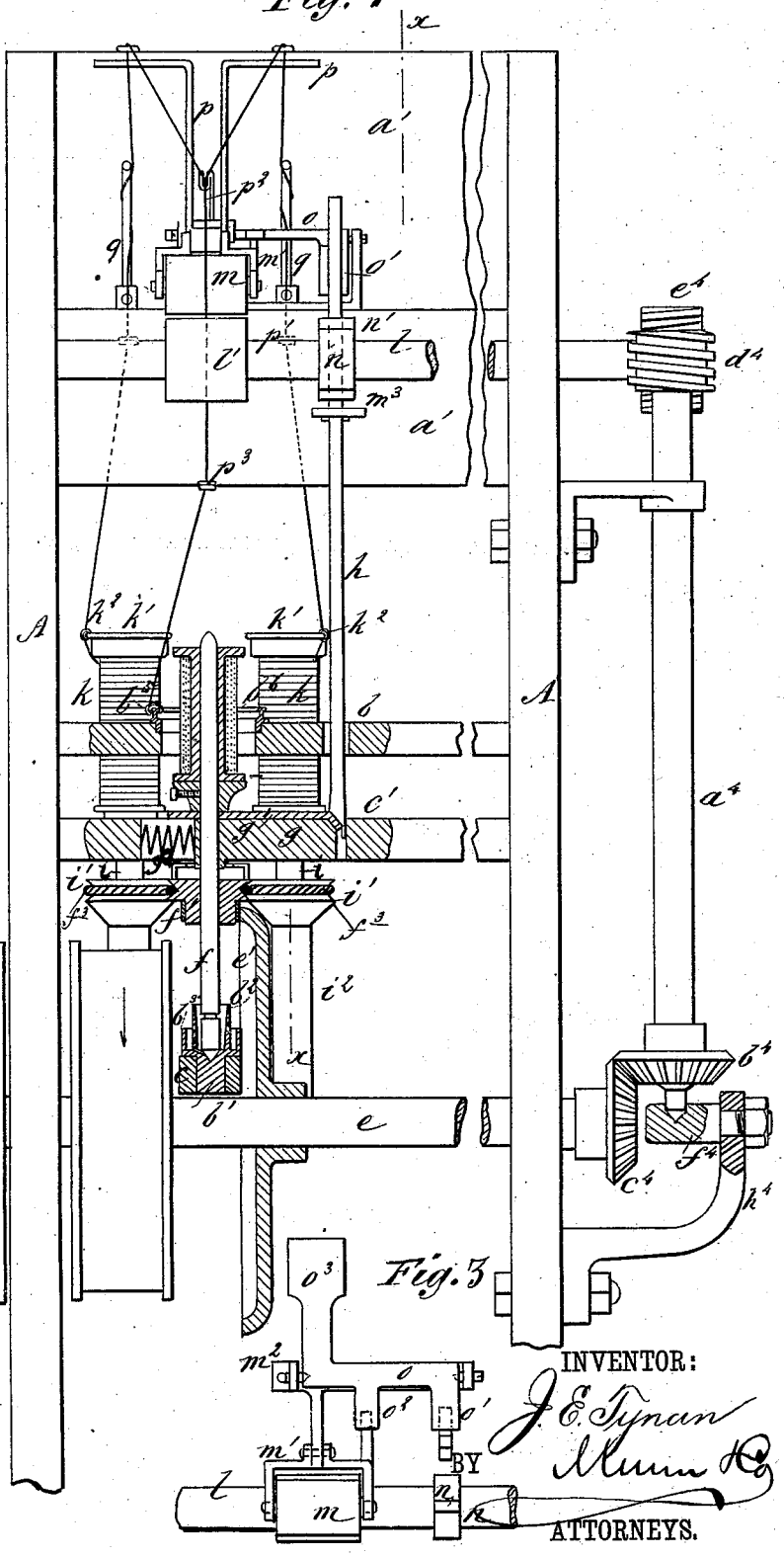

Fig. 3

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(No Model.) 2 Sheets—Sheet 2.

J. E. TYNAN.

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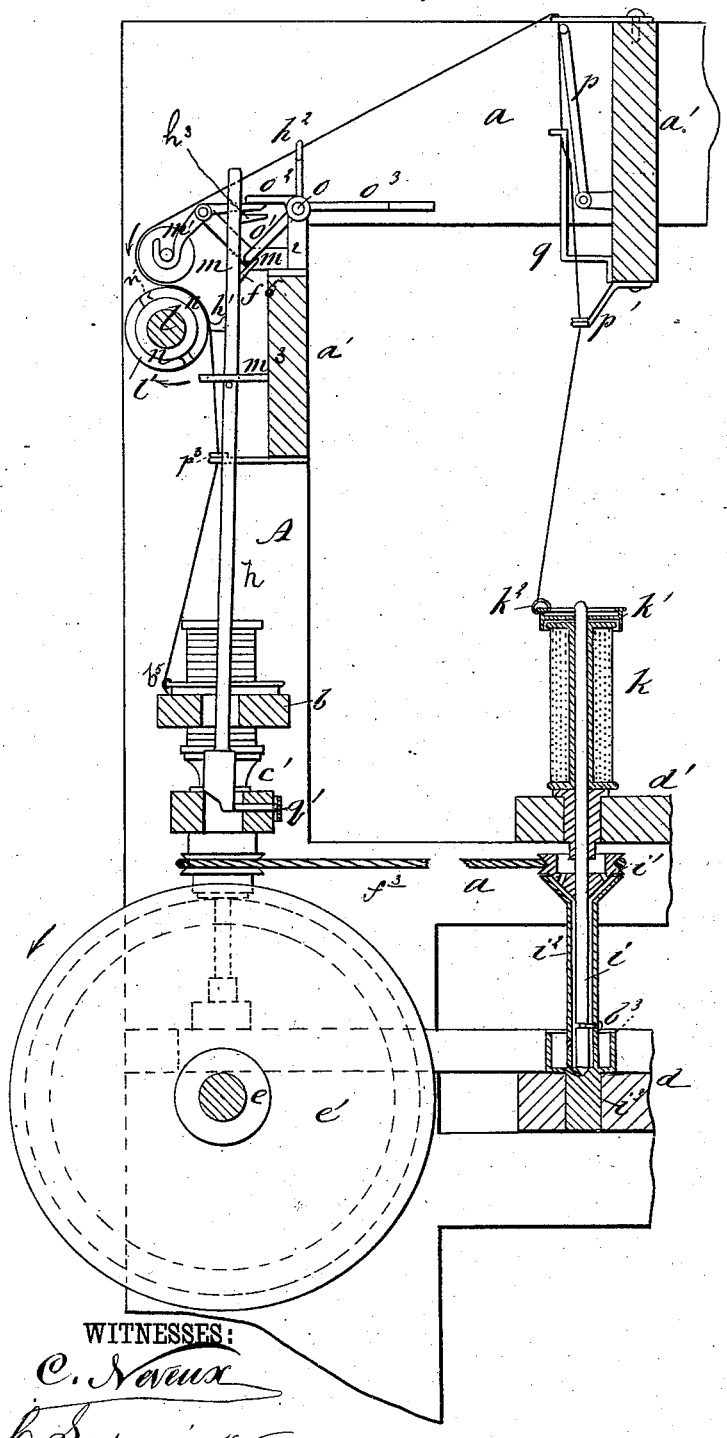
Fig. 2



WITNESSES:
C. Neveux
C. Sedgwick

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UNITED STATES PATENT OFFICE.

JOSEPH E. TYNAN, OF PATERSON, NEW JERSEY.

MACHINE FOR THROWING SILK.

SPECIFICATION forming part of Letters Patent No. 261,409, dated July 18, 1882.

Application filed March 18, 1881. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH E. TYNAN, of Paterson, Passaic county, New Jersey, have invented Improvements in Machines for Throwing Silk, of which the following is a specification.

The invention relates to those machines which spin, double, and respin silk or other fibers by a continuous operation; and it consists in the novel features hereinafter described and claimed.

Figure 1 of the drawings is a front elevation, partially sectional, of a spinning-machine with my improvements. Fig. 2 is a vertical transverse section on line *x x* of Fig. 1. Fig. 3 is a plan view of the stop mechanism. Fig. 4 is a vertical section of the spinning mechanism with the spinning-cap.

In the drawings, A A represent the frame-standards, tied by end and longitudinal rails *a a'*. *b* is the ring-rail; *c c'*, the supporting-rails of the front spindles; *d*, the rail on which the first-time spindles are stepped, and *d'* an upper rail fitted with boxes through which such spindles pass. *e* is the main shaft, fitted with fast and loose pulleys, and carrying flanged friction wheels or disks *e'*, by which the spindles are driven.

The spindles *f* of the spinning mechanism are supported in steps *b'*, fixed to rail *c*, and the boxes *b* are formed with inner and outer cups, b^2 b^3, the inner one for receiving oil and the outer one for catching the oil which overflows. The side of the inner cup, b^2, is apertured to allow escape of oil which may be carried up on the spindle, and at the bottom of the outer cup, b^3, is an aperture through which such oil returns to the step. The spindle is formed with an annular groove within the cup, which prevents the oil from rising on the spindle.

The upper supports for the spindles *f* are boxes *g*, which are placed in slots or apertures in the rail *c'*, and held therein by metal plates *g'*, which project over the top of the rail. The slots are longer than the boxes, so that the latter may slide lengthwise and springs g^2 be placed in the slots. The tendency of these springs is to press the boxes or bolsters toward one end, and thus retain the spindles upright with their friction-pulleys *f'* in contact with the driving-disk *e'*. The rod *h* of the stop mechanism moves the boxes in the opposite direction, as hereinafter described, and the rail *b* carries rings b^6, fitted with travelers b^5, as usual.

It will thus be seen that the friction-pulleys are pressed against the driving-disk by side pressure and held without increasing the friction on the steps of the spindles. This mechanism may be used in the same manner without the stop mechanism.

The first-time spindles *i* are stepped in boxes i^3, fitted in rails *d*, Fig. 2, and held vertically in bearings placed in an upper rail, *d'*. The steps are formed with oil-cups similarly to the front spindles, *f*, except that the inner tubes, i^2, are extended as tubes up to the pulleys *i'*, and are formed with flaring ends, which receive the conically-formed under sides of the pulleys.

The pulleys *i'* are recessed to form oil-cups, and apertures extend through their conical ends to the tube i^2, so that the oil from said cups will pass through the apertures into the tubes, lubricate the body of the spindle, and finally reach the lower bearings, so as to lubricate them. The oil forced outwardly over the edge of the funnel-shaped tops of the tubes will follow the outside of said tubes and finally be caught by cup b^3.

There are two spindles *i* for each spindle *f*, driven by a cord which passes around the two pulleys *i'* and the pulley *f'*, so that the three spindles of each set are simultaneously driven from the disk *e'*. The spindles *i* carry spools or bobbins *k*, above which and attached to the spindles are rings or flanged circular disks *k'*. The upper flanges or edges of these disks are made in T form and fitted with guides or travelers k^2, similar to the travelers of spinning-rings. The lower flanges project below the heads of the spools, so as to prevent contact of the thread with the spool-head as it passes from the spool and upward through the traveler.

The travelers k^2 serve to prevent the thread from unwinding too fast from the bobbin, and thus assist in giving the required tension.

The disks *k'* and travelers may be used in

any case where thread is to be unwound from bobbins and with revolving or stationary spindles.

The feed and stop mechanism is fitted above ring-rail b, as follows:

l is a shaft driven continuously by connections at one end from the main shaft e, as shown in Fig. 1, and fitted with a pulley or roller, l', for each set of spindles.

m is a roller sustained by arms m', which are hung on a bracket, m^2, so that roll m may rest by its weight on roller l'.

n' are hooked lugs or projections located upon the pulley n.

h is a rod passing through a fixed guide, m^3, (see Figs. 1, 2 of drawings,) by which it is held in an upwardly-inclined position, and formed with a lug, h', contiguous to pulley n, and a second lug, h^3, situated near its upper end. The lower end of rod h is beveled or formed with a wedge, and enters between the sliding box g and the rail c', the edge of the bolster being beveled to correspond.

Behind the upper end of rod h the bracket m^2 sustains a rock-shaft, o, which has three arms, o' o^2 o^3, one arm, o', extending above a tail-piece of the feed-roller-sustaining arms m'. Arm o^3 extends horizontally back, and arm o' extends to rod h. Behind these parts the fallers p are hung, and below these are fixed the tension-fingers q. The fallers p are of a length to strike the arm o^3 when they fall. The feed-shaft l and roller are driven from shaft e by mechanism which may be changed to vary the speed according to the material operated on.

a^4 is a shaft carrying a bevel-gear, b^4, at its lower end, engaging a similar gear, c^4, on shaft e.

d^4 is a worm on the shaft engaging the worm-wheel e^4, fixed on shaft l. The lower end of shaft a^4 is stepped on a stud, f^4, sustained in a bracket, h^4, by a nut, so that the stud is held in line with shaft e.

The stud may be turned when the nut is loosened to allow more or less inclination of shaft a^4, and thus permit use of a larger or smaller worm-wheel, e^4.

In operation the threads pass from bobbins k' to fixed guides p', then turn around the fingers q, then pass in front of fallers p up through superposed fixed guides, thence through the guide p^2 down in front of roller m, between rolls m l, thence through fixed guides p^3 to the traveler b^5 on ring b^6, and to the bobbin on spindle f.

In case the thread breaks, one of the fallers p is released, and, in falling, depresses the arm o^2, which in turn raises arm o'. The latter forces the rod h outwardly to a sufficient distance to bring the lug h' in position to engage with the lug n' on pulley n, and said pulley, revolving, forces the rod h downward, whose beveled end enters between the box g and the rail c, thereby throwing the pulley f' out of contact with the disk i and stopping the revolution of the spindles. At the same time, while the rod h is being depressed, the lug h^2 forces the arm o' below the usual position, and that in turn lowers the arm o^4, which depresses the tail end of lever and lifts the pulley m out of contact with pulley n. In this manner it will be seen that immediately upon the breaking of a thread the bobbin ceases to wind and the feed-pulley to operate. The parts resume their normal positions when the rod h is raised.

To prevent the rod h, which inclines toward rock-shaft o, from falling forward, it is provided with a hooked lug, f^5, behind which the arm o' takes.

In place of lug f^5 the arm o' may be magnetized, so as to hold the rod.

To sustain the rod h in its raised position the rail c' is fitted with a spring-pin, q', (shown in Fig. 2 of the drawings,) which extends through the side of the rail and bears on the rod. In addition to the bevel which acts on box g, the rod is beveled at the side opposite to pin q' to rest on the rail c', where it is held by the pin, and thus sustained until forced down, as described. To insure the release of pulley f' from the driving-disk when beveled pulleys are used, the under side of box g is formed, as shown in Fig. 4 of the drawings, with an inclined lug or flange, g^3, and cross-bar g^4 is fixed on rail c' in front of the lugs, so that, as the box moves forward, the bar g^4, acting on the lug will raise the box.

When it is thought desirable to employ a cap some such modification in the drive mechanism would be necessary as shown in Fig. 4 of the drawings, where the spindle r bears the cap s upon its upper extremity, and has its lower extremity resting, in the manner already described, in the box b'.

Loose upon the spindle is the sleeve r', made of sufficient length to extend within and rest in the bobbin. This sleeve has secured to it, above the rail b, a removable collar, r^2, upon which the bottom of the bobbin rests.

Attached to the lower end of the spindle is a beveled friction-pulley, s', engaging with and being revolved by the beveled edge of the disk e', secured to drive-shaft e. Upon the spindle r, near its lower extremity and beneath the aforesaid pulley s', a second pulley, f', is secured, whose periphery is in contact with disk e' between the beveled edge and center of the latter. By this construction the disk e' in revolving actuates spindle r through the medium of the pulley f, and the bobbin r^2 through the medium of the pulley s' and sleeve r'.

Having thus described all that is necessary to a full understanding of my invention, what I claim as new is—

1. The combination of the spindle f, the grooved friction-pulley f', the driving-disk e',

the first-time spindle i, the pulley i', fitted thereon, and the cord f^3, as and for the purpose specified.

2. The combination of the sliding bolster g, the spring g^2, and rail c' with the step-rail c, step b', spindle f, pulley f', and drive-disk e', as shown and described.

3. The combination of sliding bolster g, the spindles, the rod h, having a beveled lower end and provided with lug h', the pulley n, provided with lug n', the rock-shaft o, having arms o' o^2 o^3, and the fallers p to stop the spindle, as specified.

4. The combination of shaft l and means for rotating the same, feed-roll l', pivoted arms m', rock-shaft o, having arms o' o^2 o^3, fallers p, rod h, and the pulley n, having lugs n', as shown and described.

5. The bar g^4 and sliding bolster g, formed with the incline g^3, in combination with the beveled stop-motion rod h, the spindle, and the friction-pulleys, as and for the purpose specified.

6. The spring-actuated pin q', combined with the beveled rod h of the stop-motion, the apertured rail c', and the sliding bolster g, substantially as and for the purpose set forth.

JOSEPH E. TYNAN.

Witnesses:
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