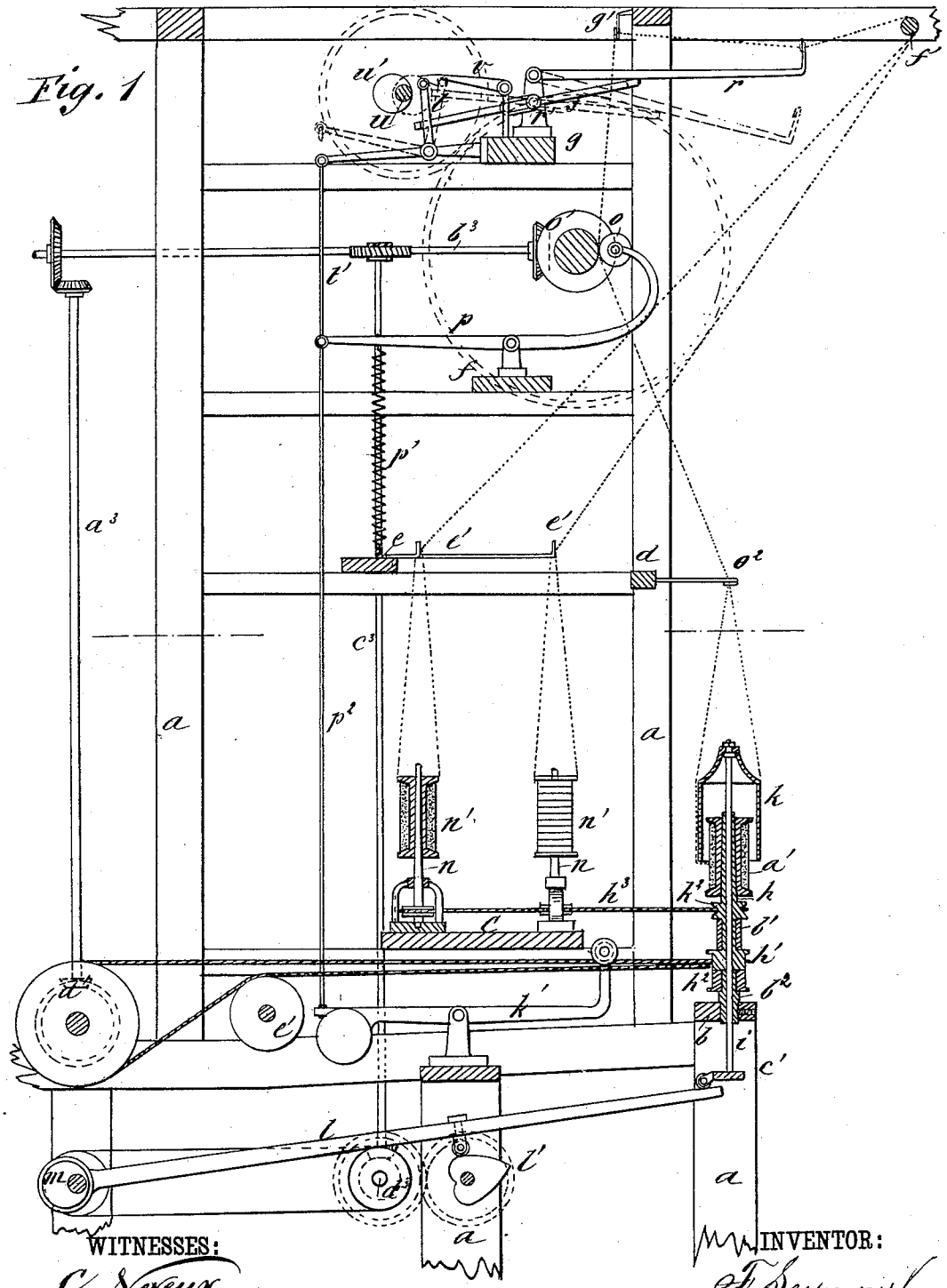
(Model.) 2 Sheets—Sheet 1.

F. SEYMOUR.

MACHINE FOR SPINNING, DOUBLING, AND RESPINNING SILK.

No. 245,878. Patented Aug. 16, 1881.

Fig. 1



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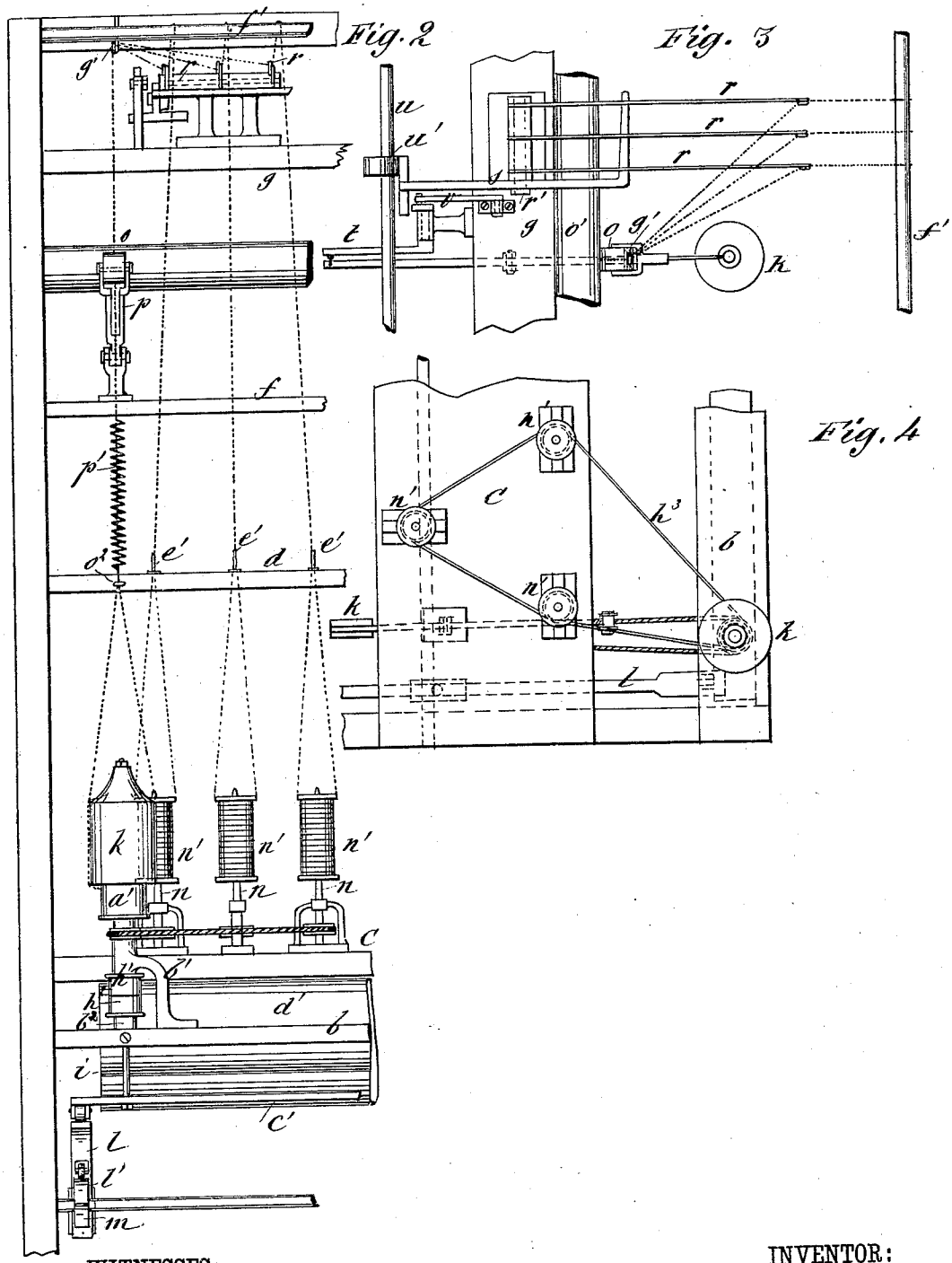

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UNITED STATES PATENT OFFICE.

FRANCIS SEYMOUR, OF PATERSON, NEW JERSEY.

MACHINE FOR SPINNING, DOUBLING, AND RESPINNING SILK.

SPECIFICATION forming part of Letters Patent No. 245,878, dated August 16, 1881.

Application filed October 25, 1880. (Model.)

To all whom it may concern:

Be it known that I, FRANCIS SEYMOUR, of Paterson, in the county of Passaic and State of New Jersey, have invented a new and useful Improvement in Machines for Spinning, Doubling, and Respinning Silk, of which the following is a specification.

My improvements relate to machines for spinning, doubling, and respinning silk by one continuous operation without intermediate spooling or reeling.

The invention consists in means for automatically throwing the spool-bearing tube out of gear when the thread breaks; also, in improved means for winding the thread solidly upon the spool; also, in certain details of construction, all of which will be hereinafter more fully described.

In the drawings, Figure 1 is a vertical transverse section of a machine embodying my improvements. Fig. 2 is a front elevation, showing one set of spindles with the stop and traverse mechanism. Fig. 3 is a detail plan view of the stop mechanism. Fig. 4 is a plan view, showing the driving mechanism of the spindles.

Similar letters of reference indicate corresponding parts.

The machine may contain any desired number of spindles, and will usually be made in double form. I have shown one set of spindles at one side of the machine.

a a are the standards of the machine, tied by longitudinal and transverse rails, of which the lower and front one, *b*, is the spool-rail. *c* is the bobbin-rail. *d e* are rails carrying drag-wires. *f* is a rail carrying the lever *p*, bearing roll *o* thereon; and *g* is an upper rail, that carries the fallers and other parts of the stop mechanism.

Above the rail *b*, and sustained by a bracket, *b'*, is a tube, *h*, formed with fast pulley *h'*, and fitted at its upper end to receive the spool *a'*.

Beneath tube *h*, and secured to rail *b*, is a short tube, b^2, carrying a loose pulley, h^2, and through the tubes b^2 *h* passes a rod, *i*, from the transverse rail *c'*, on the upper end of which rod is a cap, *k*.

d' is the driving-cylinder, from which a belt or cord passes to the pulley *h'*, over an idler-cylinder, *e'*, and beneath a friction-pulley on the end of the shifting-lever *k'*, that is operated as hereinafter described.

l is the moving-lever of the traverse-rail *c'*, operated by the heart-cam *l'*, so that the rod *i* and cap *k* are given a traverse, as usual, the length of spool *a'*.

I provide for a variable movement of rail *c'* by hanging the lever *l* upon an eccentric, *m*, carried by a shaft that is given one revolution during the winding of each layer of thread. The cam *l'* is given a revolution and a half during the same period. In this way the width of the different layers is varied and the thread wound solidly upon the spool, while the ends are retained in place and prevented from mussing.

Upon the rail *c* are fitted the spindles *n*, carrying the bobbins *n'* of unspun silk. The spindles are sustained in suitable supports, and are provided with pulleys, around which a belt, h^3, passes from a pulley, h^2, on tube *h*, so that they are all driven uniformly.

Above spindles *n*, and supported by rail *e*, are guide-eyes *e'*, through which the threads pass to and over a roller or tube, *f'*, through a guide, *g'*, and from thence downward between feed-rollers *o o'* and guide o^2 to the bobbin *a'*. The feed-roller *o'* is given a continuous rotation by suitable connections, while the roller *o* is upon the end of a lever, *p*, hung on rail *f*, so that the said roller is capable of movement to and from the fixed roller *o'*. The cylinder *d'* gives rotation by bevel-gearing to a vertical shaft, a^3, which, in turn, rotates by bevel-gearing a cross-shaft, b^3, which itself connects by bevel-gearing with the feed-roll *o'*. The latter has pinions at one end meshing with pinions on the shaft of roller *u'*. Shaft b^3 rotates, by means of a worm, a second vertical shaft, c^3, which gears with a horizontal shaft, d^3, which, in turn, gears with the shaft of cam *l'*. The cam *m* is operated by a belt from a pulley on shaft d^3. A spring, *p'*, connected with lever *p*, serves to press the movable roll to roll *o'*, thereby pinching the threads between the rolls and insuring the feed. The lever *p* and shifting-lever *k'* are connected by a rod, p^2, so that they shall move together.

Above the feed-rollers is fitted the automatic stop mechanism, constructed and operated as follows:

r r r are faller-arms, hung on rail *g*, and provided at their outer ends with eyes, through which the respective threads pass intermedi-

ately of roller f' and eye g', so that the fallers r are sustained. On rail g is also hung a balance-lever, s, one end of which is bent at right angles to pass beneath the fallers r, while the other end is formed T-shaped, and extends at one side of the end of a crank-lever, t, which is hung on rail g. The lever s is slotted where its pivot r' passes through, so that the lever may slide as well as swing. The crank-lever t is connected by a rod, t', with the lever p, carrying the movable feed-roll o.

u is a shaft carrying an eccentric, u', which shaft is given a continuous rotation by suitable connections, and the eccentric is so placed that it comes in contact with the T end of lever s when that end is raised.

v is a latch, fitted for engaging crank-lever t when the latter is moved by the endwise movement of lever s.

In operation, to spin, double, and respin by a continuous operation, the bobbins are placed as shown and described, and the threads passing from bobbins n' are first spun by the revolution of spindles n and wound on the bobbins a' in a doubled and twisted condition. In case either thread breaks or runs out the faller r of that thread falls by gravity, carries down the end of lever s, and, the eccentric u' then coming in contact with the lever s, the crank-lever t is turned, lever p raised to release feed-roller o, and shifter k' raised to carry belt h^3 to the loose pulley h^2. As soon as lever s and crank-lever t are moved the latch v engages the T end of lever s and locks the parts. The faller r having been raised and the thread united and placed in position, as soon as latch v is released by hand, and the eccentric, by turning, has ceased to bear upon the T end of lever s, the weight of shifter k and the spring p' draw down the crank-lever, whose arm, acting upon the T end of lever s, forces said lever backward. The latter, after sliding backward to the length of its slot, is drawn downward by the rearward and downward inclination of the upper arm of the lever t, and the lever s is thereby raised to its former position.

With this machine the operations are continuously performed, and the separate machines and intermediate spooling operations usually required are dispensed with. Two, three, or more spindles may be employed and driven from the tube h, a uniform speed being thereby obtained, and the one stop mechanism serves to arrest both the tube and spindles.

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

1. In a spinning-machine, the combination of two or more spindles, n, belt h^3, spinning-tube h, cylinder d', belt connecting h and d', pulley h', tube b^2, rod i, and cap k, with guides e' f' g' o^2, feed-rolls o o', and rods b^3 a^3, provided with bevel-pinions on their extremities meshing with each other and with pinions upon d' and o', substantially as and for the purposes described.

2. In machines for spinning, the combination, with the tube b^2, pulleys h' h^2, cylinder d', belt connecting d' and h', feed-roller o', and rods b^3 a^3, provided on their extremities with bevel-pinions meshing together and with pinions upon d' and o', of the fallers r, balance-lever s, crank-lever t, latch v, revolving eccentric u', feed-roller o, lever p, rods t' p', and belt-shifter k', substantially as described, whereby upon the breaking of a thread the roller o is moved and the tube bearing the spool is thrown from gear.

3. In a spinning-machine, the lever l, cam m, provided with a band-wheel, cam l', having a pinion, cylinder d^3, provided with a band, a bevel, and a spur wheel, band connecting the band-wheels upon m and d^3, and driving mechanism c^3, b^3, a^3, and d', in combination with rail c, rod i, and cap k, substantially as and for the purposes specified.

FRANCIS SEYMOUR.

Witnesses:
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C. SEDGWICK.