

(No Model.)

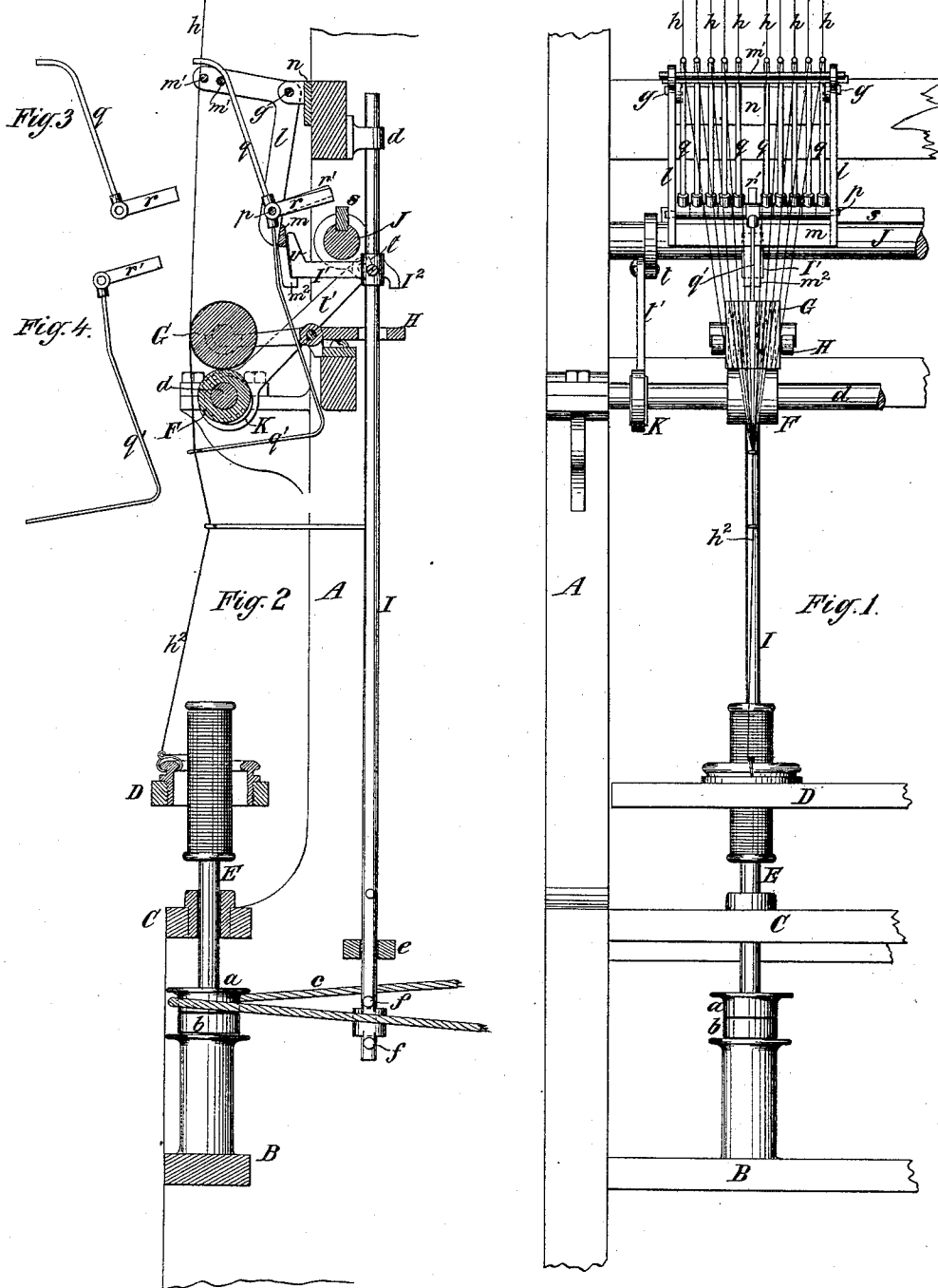
2 Sheets—Sheet 1.

W. R. LANDFEAR.

STOP MOTION MECHANISM FOR MACHINES FOR DOUBLING AND SPINNING SILK, &c.

No. 336,570.

Patented Feb. 23, 1886.



Witnesses:
 Edw. Haynes
 O. Sundgren

Inventor:
 William R. Landfear
 by his Attorneys
 Rowntree & Hall

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2 Sheets—Sheet 2.

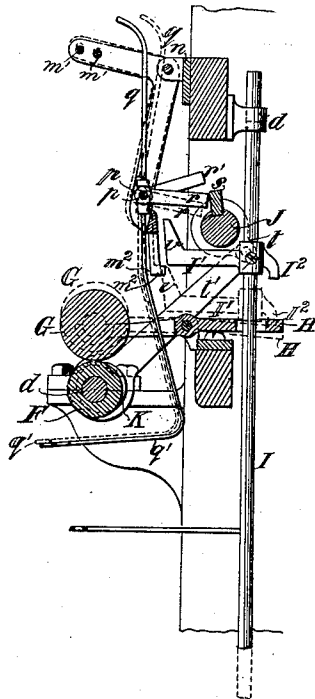
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Fig. 5



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UNITED STATES PATENT OFFICE.

WILLIAM R. LANDFEAR, OF BROOKLYN, NEW YORK.

STOP-MOTION MECHANISM FOR MACHINES FOR DOUBLING AND SPINNING SILK, &c.

SPECIFICATION forming part of Letters Patent No. 336,570, dated February 23, 1886.

Application filed May 8, 1884. Serial No. 130,723. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM R. LANDFEAR, of the city of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in the Stop-Motion Mechanism for Machines for Doubling and Spinning Silk and other Fibrous Materials, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to machines in which two or more threads are "doubled" and twisted together; and the improvement consists in certain means hereinafter described, whereby the driving-band of each spindle may be shifted from a fast to a loose pulley on the spindle whenever any one of the several threads which are being doubled breaks or gives out before its arrival at the doubling-rolls, and whenever any breakage takes place between the doubling-rolls and the twisting-spindle.

Figure 1 in the drawings is a front elevation of part of a doubling and spinning frame to which my invention is applied, showing one twisting-spindle with its corresponding doubling-rolls and the whole of the stop-motion mechanism belonging to said spindle. Fig. 2 exhibits a vertical section of the frame at right angles to Fig. 1, and a side view of one spindle and of the stop-motion mechanism thereto belonging, showing the parts in the position they occupy while all the threads are in proper condition for spinning. Fig. 3 is a side view of one of the drop-wires which are acted upon by the single threads to stop the spindle. Fig. 4 is a side view of the drop-wire which is acted upon by the doubled thread. Fig. 5 is a diagram corresponding with Fig. 2, but showing the position of the parts of the stop-motion when a thread breaks.

Similar letters of reference indicate corresponding parts in the several figures.

A is the side framing of the machine; B, the step-rail; C, the bolster-rails; D, the ring-rail.

E is the spindle, having a fast pulley, *a*, and a loose pulley, *b*, either of which pulleys receives the driving-band *c*.

F G are the doubling-rolls, the lower one of which is fast on a shaft, *d*, which extends the whole length of the frame and receives a positive rotary motion, and the upper one of which is hung in an independent lever-frame, H.

I is the band-shifting rod, working in fixed guides *d e*, and having at its lower ends the pins *f f*, between which the band *c* runs, and which constitute the spindle-band shifter.

All the parts hereinabove described are such as are common to the doubling and spinning frames in use, and the single threads *h h* to be doubled come to the doubling-rolls from bobbins, which are not represented, but are arranged to turn freely on fixed spindles arranged in positions slightly inclined from the horizontal on the upper part of the frame, as is common in such machines.

I will now proceed to describe the stop-motion. Above and slightly in rear of the doubling-rolls F G, and behind the paths of the several single threads *h h*, there is arranged a swinging frame, *l l m m' m'*, which may be called the "drop-wire" frame, composed of two upright elbow-levers, *ll*, and connecting horizontal bar *m m' m'*. This frame is pivoted by pivots *g g* to a plate, *n*, which is secured to one of the upper front rails of the framing. In this frame there are pivoted or hung on pin *p*, running lengthwise through the said frame, a number of drop-wires, *q q*, one for each thread to be doubled, and a single drop-wire, *q'*, for the doubled thread *h²*. The drop-wires *q q* have each a tail-piece, *v*, and the drop-wire *q'* has a tail-piece, *v'*, the several tail-pieces being severally heavy enough to slightly more than counterbalance the drop-wires. The lower bar, *m*, of the drop-wire frame is furnished with a rigid hook or dent, *m²*, the purpose of which is to engage with an arm, *I*, secured firmly on the band-shifting-rod I, and hold up the said rod in a position to keep the band on the fast pulley *a* of the spindle, as shown in Fig. 2, and the weight of the said frame and the drop-wires tend to keep the hook so engaged. The front of the said arm *I* is inclined, as shown at *v* in Fig. 2, for the purpose hereinafter explained.

Behind the several drop-wire frames of the machine, and below the level of the pin *p*, there is arranged in suitable bearings in the machine-framing a horizontal shaft, J, which extends the whole length of the machine, and is furnished on its upper part with a longitudinal projection in the form of a spline, *s*. In this example of my invention the shaft J has

a rocking motion or a reciprocating motion around its axis, which it derives through its arm t and a rod, t' , from an eccentric, K , on the doubling-roll shaft d , or from any other constantly-moving part of the machine. This rock-shaft and spline constitute a knock-off device for knocking off the drop-wire frame to liberate the band-shifting rod, as will be presently described. The single threads pass downward to the front of the roll G , thence around the same and between it and the roll F , and finally down in front of and out of contact with the roll F . The single threads h , passing from the bobbins above through the eyes in the ends of the drop-wires q to the doubling-rolls, operate by their tension to keep the tail-pieces r of the said drop-wires above and out of reach of the spline s of the rock-shaft J , and in like manner the doubled thread h^2 , between the doubling-rolls and the spindle, passing through the eye of the drop-wire, operates by its tension to keep the tail-piece r' of the said drop-wire above and out of the reach of the said spline, which is inoperative until a thread breaks; but when either of the single threads breaks or gives out, or the doubled thread breaks, its respective drop-wire, being liberated from its tension, no longer holds up its tail-piece, and the latter drops in front of the spline of the rock-shaft, which the next time it rocks forward presses against the end of the said tail-piece, and so pushes forward the lower part of the drop-wire frame far enough for its hook or detent m^2 to liberate the arm I' of the band-shifting rod I , as shown in Fig. 5 in bold outline, and allows the said rod to drop, as shown in dotted outline in Fig. 5, and shifts the belt from the fast pulley a to the loose pulley b of the spindle. The said rod at the same time, by the projection I^2 on its arm I' falling on the rear end of the lever-frame H , produces the raising of the upper doubling-roll, G , from the lower roll, F , which drives it. The spindle and the upper doubling-roll then soon stop. After the point of the detent m^2 passes beyond the lower edge of the arm I' , and the said arm and the rod I consequently drop, the descent of the said arm causes its inclined front end, v , to act like a wedge on the front of the detent m^2 , as shown in dotted outline in Fig. 5, and so push forward the drop-wire frame far enough to carry the tail-pieces beyond the reach of the oscillation of the spline s , which otherwise keep the drop-wire frame and drop-wires knocking about until the broken or missing thread were pieced or replaced.

What I claim as my invention, and desire to secure by Letters Patent, is—

60 1. The combination, with the band-shifting

rod and an arm projecting laterally therefrom, of a drop-wire frame pivoted to a fixed support and furnished with a detent, which by the swinging movement of said frame may be engaged with or freed from the arm on said rod, drop-wires pivoted in said pivoted frame, and a knock-off for operating, through said wires on said frame, to swing the frame in a direction to free its detent from the arm on said band-shifting rod, substantially as herein described.

2. The combination, with the band-shifting rod and an arm projecting laterally therefrom, of a drop-wire frame pivoted to a fixed support and furnished with a detent, which by the swinging movement of said frame may be engaged with or freed from the arm on said rod, drop-wires pivoted in said pivoted frame and having overbalancing tail-pieces, a shaft having a projection for acting on said tail-pieces, and means for operating said shaft, whereby on the breaking or giving out of a thread the drop-wires and their pivoted frame are moved together by said shaft to swing the frame in a direction to free the detent from the arm on the band-shifting rod, substantially as herein described.

3. The combination of the pivoted drop-wire frame $l m m' m'$, provided with the hook or detent m^2 , and fixed supports for the pivots thereof, the drop-wires q , one for each thread to be doubled, having the overbalancing tail-pieces r , pivoted in said frame, the band-shifting rod I , having an arm to engage with the hook of the drop-wire frame, the shaft J , having a spline, s , and means of operating said shaft, all substantially as and for the purpose herein set forth.

4. The combination of the pivoted drop-wire frame $l m m' m'$, provided with the hook or detent m^2 , and fixed supports for the pivots thereof, the drop-wire q' for the doubled thread, having an overbalancing tail-piece, r' , pivoted in said frame, the band-shifting rod having an arm to engage with the hook of the drop-wire frame, the shaft J , having a spline, s , and means of operating said shaft, all substantially as herein described.

5. The combination, with the band-shifting rod, the pivoted drop-wire frame having a detent, and an arm provided on the said rod to rest on said detent, and having an inclined surface to act as a wedge upon said detent when not supported thereon, all substantially as herein described.

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