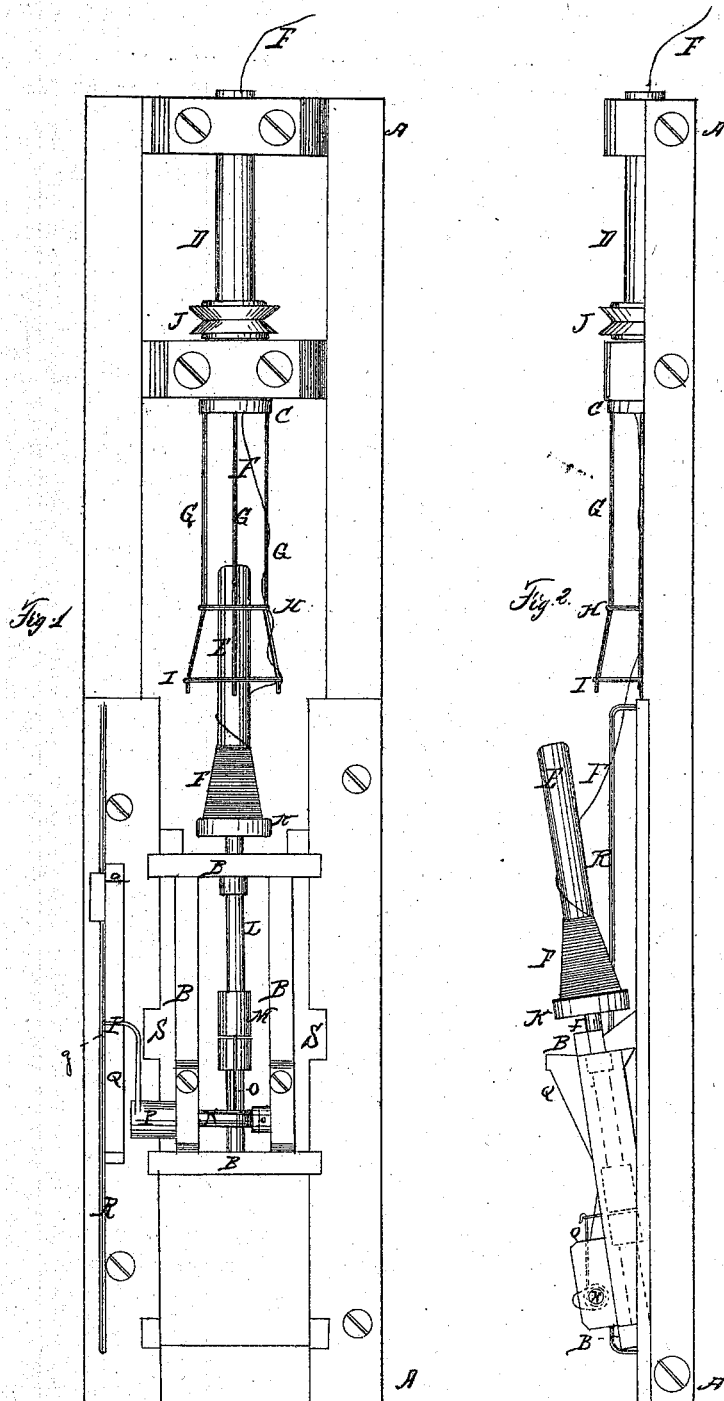


J. GOULDING.  
Spinning-Machine.

No. 115,191.

Patented May 23, 1871.



Witness:  
C. M. Miles  
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# UNITED STATES PATENT OFFICE.

JOHN GOULDING, OF WORCESTER, MASSACHUSETTS.

## IMPROVEMENT IN SPINNING-MACHINES.

Specification forming part of Letters Patent No. 115,191, dated May 23, 1871.

*To all whom it may concern:*

Be it known that I, JOHN GOULDING, of the city and county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Spinning-Machines; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon.

To enable others skilled in the art to make and use my invention, I will proceed to describe its nature, construction, and use.

My invention consists in the peculiar device or mechanism for producing variable tension upon the bobbin-spindle.

The drawings represent part of a spinning-frame with the mechanism embodying my invention.

Figure 1 shows the mechanism in front elevation. Fig. 2 is a side elevation of the same.

A denotes a portion of the main or flier frame, in the upper part of which are mounted in suitable bearings tubular flier-necks D, from a collar, C, at the lower end of each of which depend the vertical arms G, which impart the twist to the yarn F and lay it upon the bobbin E, (the yarn to be twisted, or doubled and twisted, being shown as passing through the tube D, around one of the arms G, then over the ring H, again around the arm G, then over the ring I, to the bobbin E.) Each flier-neck carries a pulley or whirl, J, by which a positive rotative movement is imparted to the flier, the bobbins E being mounted upon spindles L, which are not positively rotated, they only rotating by the drag of the yarn. The flier-arms G are made of quite small wire, and at their lower ends, and at a short distance above, they are united by hoops or rings H I, as seen in the drawings. The bobbin-spindles are mounted in a frame or carriage, B, which slides vertically upon suitable ways or rails to raise and lower the bobbins, the bobbins projecting up through the flier-rings, and, by their vertical movements, causing the yarn to be properly laid from the head K to the point of the bobbin, the reciprocating movements of the bob-

bin-frame being imparted by any suitable mechanism.

By suspending the flier-arms as shown, and uniting them by means of the rings, they can be made quite light, and can be run at a much greater speed than is imparted to ordinary fliers without springing out by centrifugal force, and consequently without producing undue strain upon the yarn.

When the bobbin-frame is at its lowest position the bobbins are entirely out of the flier-rings; and to doff the full bobbins or apply empty ones I arrange the frame to tip outwardly, so that when so tipped the bobbins can be moved vertically upon the spindles without contact with the fliers. For this purpose I make each vertical rail upon which the bobbin-frame slides with a notch or opening, S, which lets out the upper head B of the bobbin-frame, (when the frame is lowered,) as seen in Fig. 2.

To adjustably regulate the tension upon the bobbin-spindle so that the yarn shall be laid with the same strain from the surface of the bobbin-tube out to the outer surface of the yarn, (at the part of the bobbin filled,) or from the smallest to the largest diameter of a full bobbin, I apply a mechanism which increases the tension upon the bobbin as the bobbin-frame ascends and lessens it as it descends, this mechanism being substantially as follows: Upon the spindle is a loose sleeve, brake, or shoe, M, embracing or fixed to which is a spring, O, whose lower end is attached to a rocker-shaft, N, at one end of which is a crank-arm, P. A projection from this crank-arm rides over an incline, Q. As the bobbin-frame rises the crank-arm is thrown out by the incline, thereby turning the rocker-shaft and creating a stress upon the spring, and, through the spring, increasing the friction of the sleeve against the bobbin-spindles as the diameter of the wound yarn increases, the stress being lessened as the bobbin next falls and the diameter of the wound yarn decreases. The incline Q slides upon a rod, R, and the incline is provided with suitable stops or projections, so that when the bent end of the crank-arm strikes either projection it moves the incline with it, thus automatically

adjusting the position of the incline in accordance with the position of the part of the bobbin that is filling.

I claim—

In combination with the bobbin-frame and bobbins, the sleeve, shoe, or brake M, and the described mechanism for operating it to vary

the friction upon the spindle, substantially as described.

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Witnesses:

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