

(No Model.)

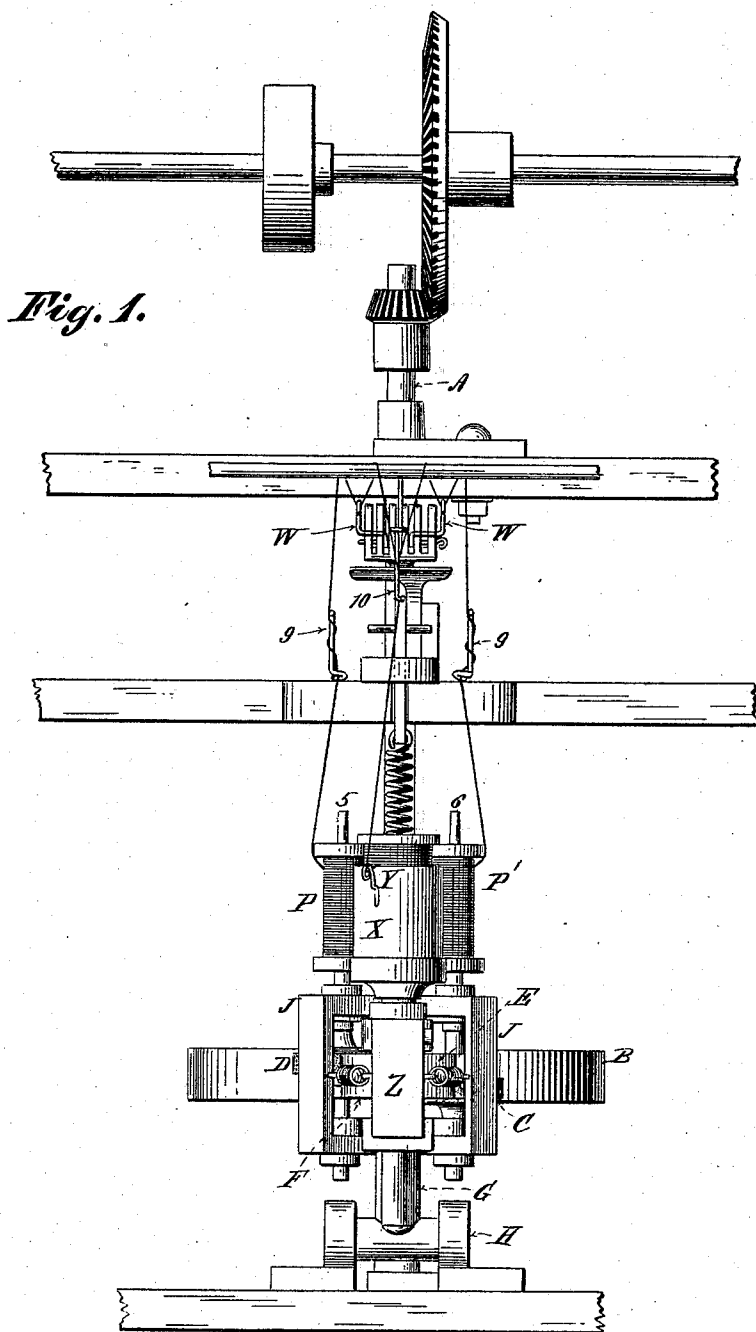
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F. SEYMOUR.

SPINNING, DOUBLING, AND TWISTING MACHINE.

No. 578,678.

Patented Mar. 9, 1897.



Witnesses:

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Inventor:

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(No Model.)

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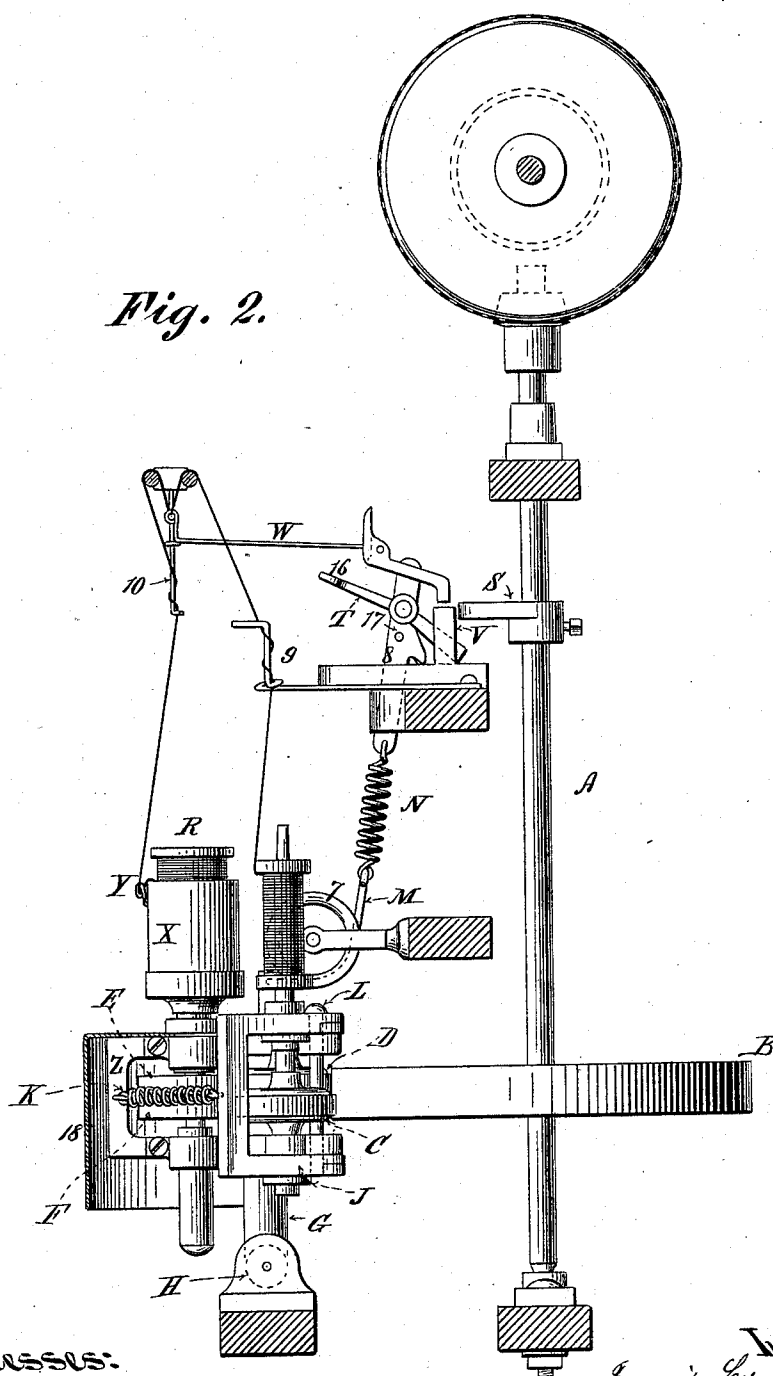
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Fig. 2.



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Fig. 3.

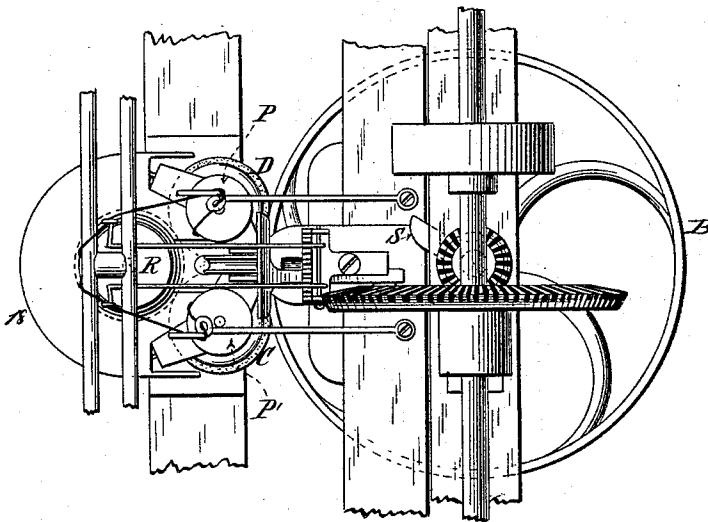
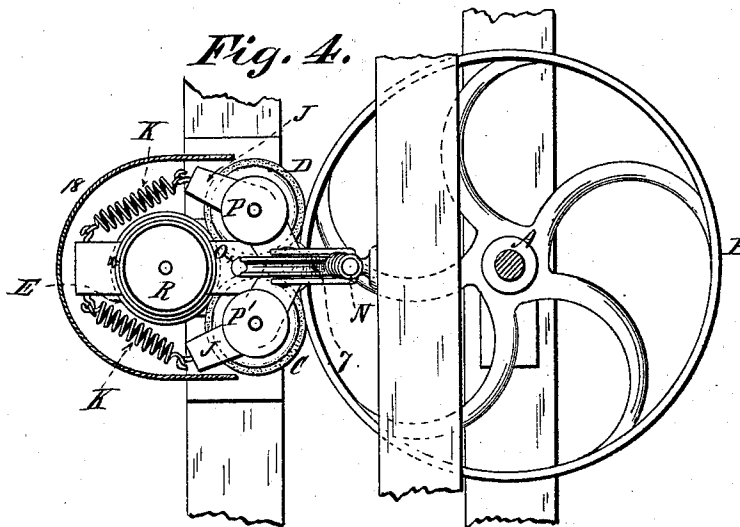


Fig. 4.



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Fig. 5.

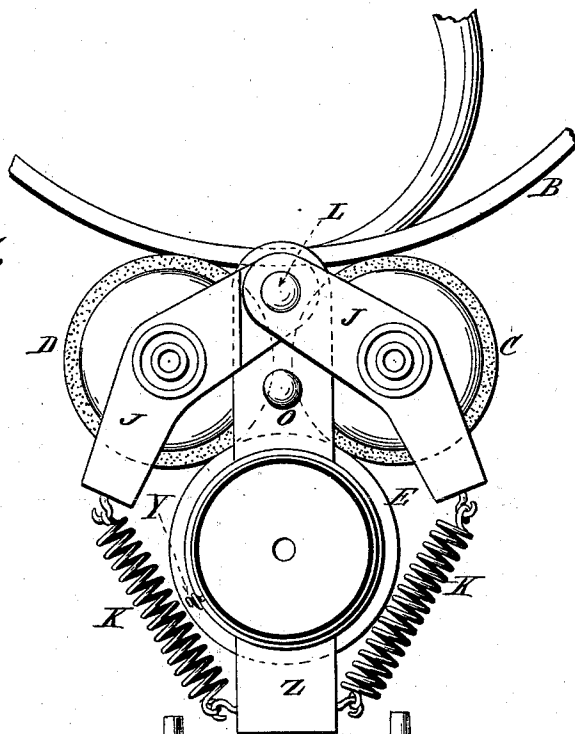


Fig. 6.

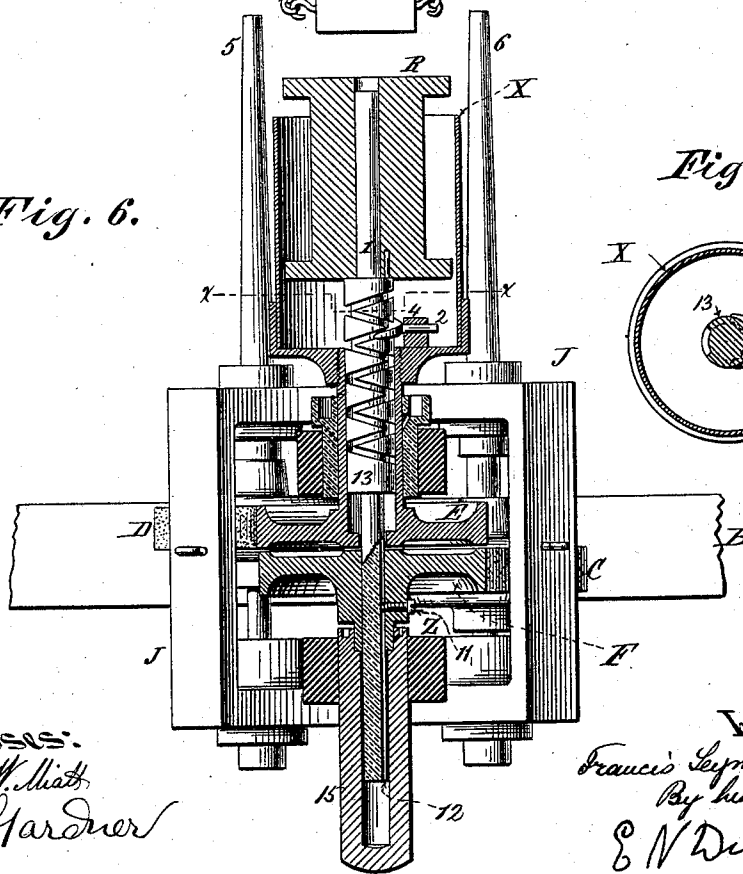
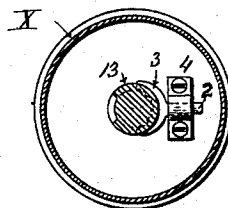


Fig. 7.



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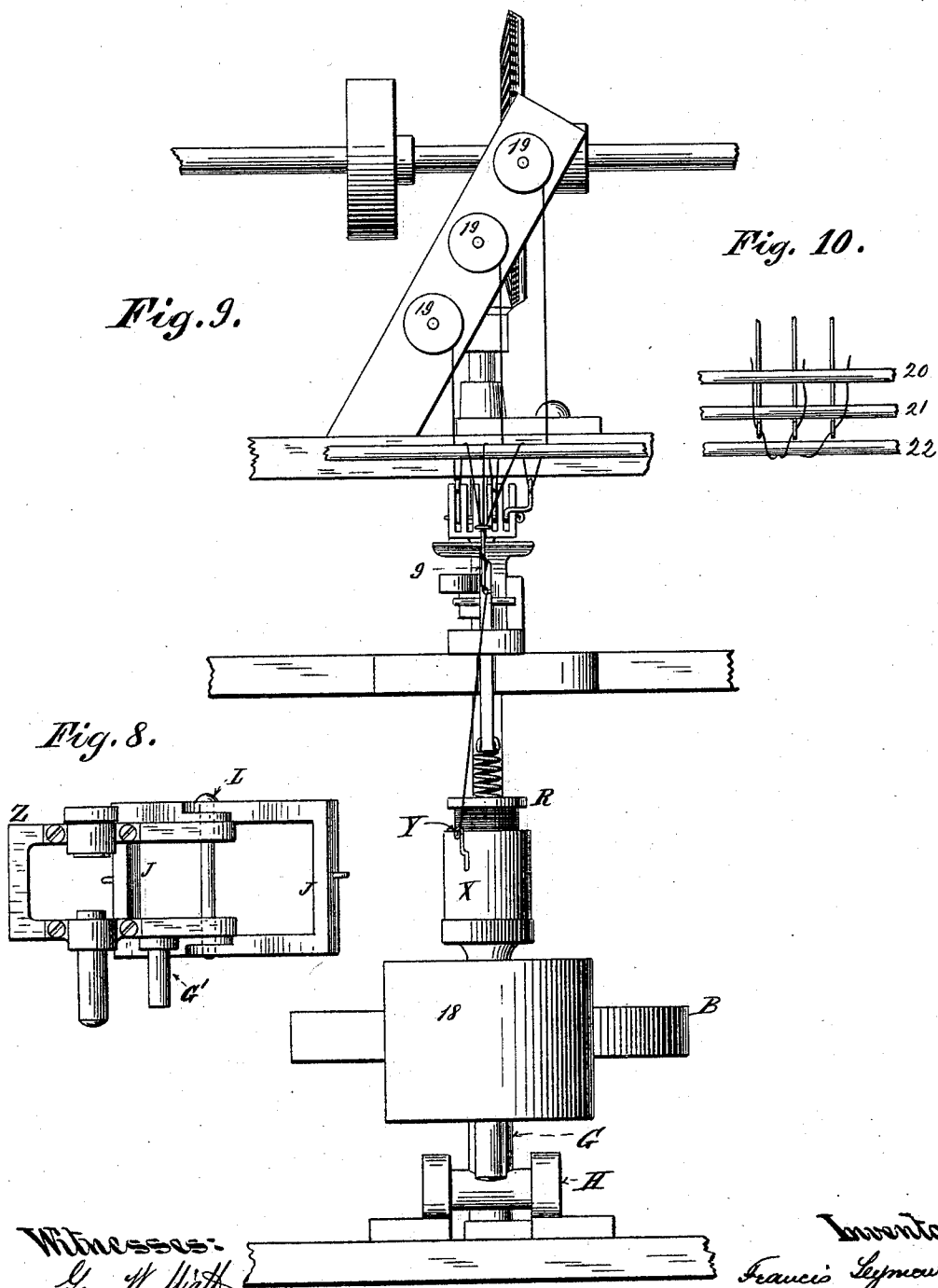
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SPINNING, DOUBLING, AND TWISTING MACHINE.

No. 578,678.

Patented Mar. 9, 1897.



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UNITED STATES PATENT OFFICE.

FRANCIS SEYMOUR, OF PATERSON, NEW JERSEY, ASSIGNOR TO THE
AUTOMATIC COMPANY, OF NEW YORK, N. Y.

SPINNING, DOUBLING, AND TWISTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 578,678, dated March 9, 1897.

Application filed February 24, 1890. Serial No. 341,483. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS SEYMOUR, of Paterson, Passaic county, State of New Jersey, have invented a new and useful Improvement in Spinning, Doubling, and Twisting Machines, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

This invention relates to an improvement in that class of machines in which the raw hard silk is spun, doubled, and twisted in one operation. The raw hard silk in these machines is delivered upon spools, and the object is to spin the same, to double two or more threads, and to twist these combined threads, which process is ordinarily carried out to-day by two or more machines.

By my invention I am enabled to arrange a compact device in which not only are these operations carried on in one machine, but the said machine can be readily duplicated around a single driving power, so as to enable a number of them to be arranged in a very compact space.

My invention will be readily understood from the accompanying drawings, in which—

Figure 1 represents a front elevation of my device; Fig. 2, a lateral elevation, partly in section, of the same; Fig. 3, a plan view; Fig. 4, a plan view, partly in section; Fig. 5, a detail of the automatic friction driving mechanism; Fig. 6, a vertical section through the traverse motion of the receiving-spool; Fig. 7, a section through Fig. 6 on the line *xx*; Fig. 8, a detail of the spool-supporting frame. Fig. 9 shows a modification of the machine arranged for tram or twist, and Fig. 10 a detail of the doubler-rods.

The parts of my machine are supported in a suitable frame, (not fully shown,) and the spinning devices may be duplicated to any convenient extent around the driving-wheel B, driven from the shaft A. The driving-wheel B drives the spools by friction instead of by belts, which is a great advantage, owing to the liability of the belts to break and thereby injure a considerable amount of material. The spinning-spools are driven from the friction-wheels CD, one arranged a little above the other, as plainly shown in Fig. 6, for a purpose to be hereinafter explained.

These spinning-spools and the receiving-spool are mounted together upon a frame Z, which is supported in the socket G by pin G', (see Fig. 8,) and is therefore capable of lateral revolution in the socket. The frame Z and the supported spools are capable, likewise, of rotation around the pivot H at right angles to the socket G, whereby the spinning apparatus is brought in contact with the driving-wheel B. It is normally held in contact with said driving-wheel by means of the spring N, to which is attached a cord or chain M, passing around a pulley 7, the other end of the cord M being attached to the pivoted frame Z, as, for instance, by the stud O. The spring is held in its strained position by a hook 8, which hooks upon the part V normally, but can be released therefrom when the stop mechanism operates, as hereinafter to be explained. This spring N serves to maintain a constant and sufficient friction-pressure between the driving-wheel B and the wheels C D, which are preferably provided with a soft or friction surface, as plainly shown in Fig. 5.

The wheels C D themselves drive two other wheels E F, the lower one, F, being of slightly less diameter than the upper one, E. Through these wheels E F the receiving-spool and its traverse are operated, as will be hereinafter explained. The wheels D C rotate the spinning-spools on spindles 5 6, and these wheels and the spindles are supported in the pivoted frames J J, pivoted as at L, and drawn toward wheels E F, respectively, by springs K K, permanently attached to part of the frame Z. In this way a constant driving friction is maintained between the wheels C D and the wheels E F, and the wheels C D, being independently mounted and capable of vibration on their axis of support, a uniform and sufficient friction is readily obtained, thereby allowing for any wear on the driving parts. The hard silk on the spools P P', mounted on spindles 5 6, is directly spun in the usual way around these spools. The threads then pass upward around the tension-wires 9 9, then separately over the guide-rod, then through the faller-eyes W, and, finally, are united around the tension-wire 10, after passing over a second guide-rod arranged on the opposite side of the faller-

eyes. This is clearly shown in Figs. 1 and 2, which show tension-wires 9 and 10 and the faller-eyes W supported by the threads passing over the guide-rods. If the thread breaks, the faller-eyes drop, stopping the machine, as will be hereinafter explained. From the tension-wire 10 the united threads pass to the eye Y of the tubular flier X. This tubular flier X is supported in fixed bearings and driven from the wheel E, as plainly shown in Fig. 6. The receiving-spool R, mounted upon the spindle 1, rotates in the same direction as the tubular flier, but is capable of a vertical motion or traverse. It is driven from the wheel F, provided with a screw or feather 11, engaging in slot 12 on the stem of the spindle. By reason of the fact of the wheel F being less in diameter than the wheel E the motion of the spindle is somewhat more rapid than the motion of the tubular flier, and in this way the traverse is arranged. The spindle 1 is provided with a cylindrical portion 13, having cut thereon a double or reversing screw-thread with which the latch 3, pivoted on stem 2 in support 4 in the tubular flier, engages. When this latch 3 has completed its traverse through one screw-thread, it is switched or passes into the other screw-thread, thereby occasioning a reverse vertical motion of the spindle 1. By varying the relative sizes of the wheels E F a variation in the twist can be accomplished, as it likewise can be by varying the size of the spool R. The speed of traverse can likewise be regulated by the relative sizes of the wheels E F. The vertical motion of the spindle 1 is allowed by reason of the elongated step 15, within which the said stem slides.

The various bearings of the moving parts are clearly shown in Fig. 6 and do not require detailed description. The stop-motion is controlled by the faller-eyes W, pivoted in the fixed frame of the machine. When released, the faller-eyes strike the balance-levers 16, raising their inner ends, so that they may be struck by the striking-cam S, rotating on the shaft A. The levers 16 being pivoted to the hooks 8 the striking-cam S forces these hooks outward past the plates V, thereby allowing them to fall and release the tension on the springs N. The downward motion of the hooks 8 is arrested by the pin 17 bringing up against the plate V, through which a slot is cut, allowing of the passage of the hook 8. The protecting cover for the spindle-bearings is shown at 18.

The release of the spring N permits the wheels C D to fall away from the driving-wheel B, the parts being so balanced as that the center of gravity is beyond the pivot H. Any set of spindles is then separately released from the driving-wheel B without interfering with the operation of any other set.

In Figs. 9 and 10 the machine is shown as arranged for doubling and twisting threads without spinning. In this arrangement spools 19, horizontally arranged, contain the

70 silk to be doubled and twisted. The silk threads pass from the spools 19 under and over three doubler-rods 20, 21, and 22, passing under the first rod 20, over the second rod 21, thence through the faller-eye, and then over the final rod 22, and thence through the doubling-eye 9. Thence the doubled threads pass as before to the tubular flier X.

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

1. The combination in a spinning, doubling and twisting machine, of two spinning-spool spindles and provided with friction-wheels, a receiving and twisting spool spindle provided with a friction-wheel driven by one of the before-mentioned friction-wheels, a frame upon which all of said spindles are mounted, and a friction driving-gear directly engaging the said friction-wheels on the said spinning-spool spindles, substantially as specified.

2. The combination in a spinning, doubling and twisting machine, of two spinning-spool spindles, and a receiving and twisting spool spindle, with a friction-wheel mounted upon each of said spindles, and a driving-wheel having its circumference in direct engagement with the friction-wheels mounted upon the spinning-spool spindles, the friction-wheel upon the receiving and twisting spool spindle impinging against one of the other friction-wheels and being driven thereby, substantially as specified.

3. The combination of a driving-wheel, two spindles each provided with a friction-wheel, a frame in which said spindles are mounted a stationary support on which said frame is hinged enabling it to swing toward or away from the driving-wheel, and an intermediate pivotal connection substantially as shown, enabling the frame to swing about an axis at right angles to its first-mentioned movement, as shown and described.

4. The combination of the driving-wheel B, the frame Z carrying the spindle for the receiving-spool R, the friction-wheel F secured to said spindle, the pivoted frames J J each carrying a spindle for a spinning-spool, said frames supported upon the frame Z, the springs K K and the friction-wheels D, C, secured to the latter-named spindles substantially as specified.

5. The combination of a driving-wheel, two spinning-spool spindles, friction-wheels attached to such spindles, means for causing the friction-wheels to be held in yielding peripheral contact with the driving-wheel, a receiving-spool spindle, a friction-wheel attached to this spindle, means for driving this friction-wheel, and guides for leading threads from the spinning-spools to the receiving-spool, substantially as specified.

6. The combination of two spindles carrying spinning-spools and provided with friction-wheels, a spindle carrying a receiving and twisting spool and also provided with a friction-wheel, a driving-wheel for rotating the friction-wheels of the two first-mentioned

spindles, springs for causing frictional contact between the two first-mentioned friction-wheels and said driving-wheel, and a spring for causing frictional contact between the driving-wheel and the friction-wheels secured to the spindles carrying the spinning-spools, substantially as specified.

7. The combination of the driving-wheel B, the spindles 5 and 6, the wheels D and C attached thereto and frictionally driven from said driving-wheel, the flier X and the receiving-spool R, the wheels E and F of different diameters attached respectively thereto, and frictionally driven from said wheels C and D, substantially as specified.

8. The combination of a number of supports for spools, a spindle for a receiving-spool, a frame carrying said spool-supports and spindle and having a hinged connection with its support and also a pivotal connection permitting said frame to swing about either a horizontal or a vertical axis, means for uniting or bringing together a plurality of threads and leading them to a receiving-spool, a flier, a traversing mechanism for moving the flier lengthwise of the spindle and carrying the

receiving-spool, and wheels for driving said spindle by frictional contact, substantially as described.

9. The combination of the spindle 1 adapted to support a spool and provided with a longitudinal slot and a reversing-screw, the tubular flier X adapted to revolve about the spindle, the latch 4 mounted in a bearing screwed to the flier and entering the thread of the reversing-screw, the wheel F provided with a screw 11 entering the longitudinal slot in the spindle, for actuating the spindle, the wheel E rigidly affixed to the flier and having a different diameter from that of the wheel F so that said spindle and flier may be relatively operated at different speeds, the friction-wheels D C impinging against the wheels E F, and the wheel B for frictionally driving the wheels D C, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

FRANCIS SEYMOUR.

Witnesses:

HARRY COUTANT,
ANTHONY GREF.