

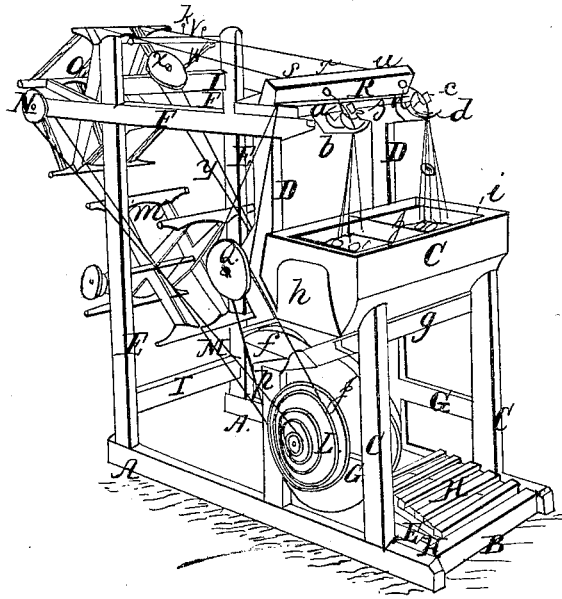
Sheet 1. 2 Sheets.

J. Dennis, Jr.
Silk Winding Mach.

N^o 1,040

Patented Dec. 28, 1838.

Drawing N^o 1.



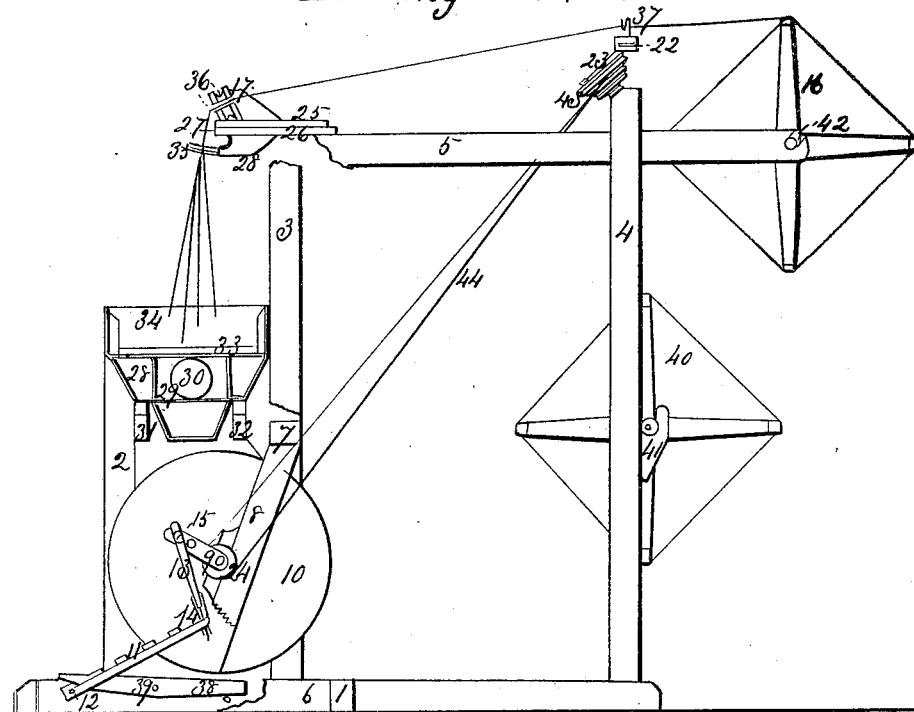
Sheet 2. 2 Sheets.

J. Dennis, Jr.
Silk Winding Mach.

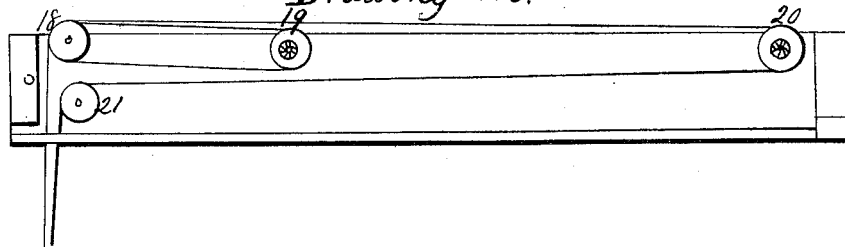
N^o 1040.

Patented Dec. 28, 1838.

Drawing N^o 2.



Drawing N^o 3.



UNITED STATES PATENT OFFICE.

JONATHAN DENNIS, JR., OF PORTSMOUTH, RHODE ISLAND.

MACHINE FOR SPINNING, DOUBLING, AND TWISTING SILK.

Specification of Letters Patent No. 1,040, dated December 28, 1838.

To all whom it may concern:

Be it known that I, JONATHAN DENNIS, Jr., of Portsmouth, in the county of Newport and State of Rhode Island, have invented a new and useful machine for spinning silk from cocoons and doubling and twisting it for sewing silk or twist and for the manufacture of any kind of silk goods; and I do hereby declare that the following is a full and exact description.

The nature of my invention consists in spinning and doubling and twisting the silk from the cocoons at the same time upon one machine that is so constructed that when part of the spindles are spinning the others are doubling and twisting that which has already been spun. It is furnished with a treadle rack for the foot of the tender, over which there is a boiler so constructed that the water is over and upon each side of the fire. This boiler has a strainer that fits it to prevent the remains of the cocoons from sinking and to remove the cocoons when the spinning is stopped. This strainer is divided by partitions to keep the cocoons for each thread spun by themselves.

This machine gives the fibers of silk any degree of twist that may be required for any of the purposes for which silk may be wanted as soon as they pass the first guide after leaving the cocoons in the water, which enables the operator to apply the ends or fibers from new cocoons, with the greatest facility, and they lie smoother and adhere firmer in consequence of the twist thus given to the silk. As it is doubled and twisted it is drawn around a pulley that prevents one strand from running before the other, and one edge of the pulley runs in a basin of water to keep the strands continually wet. The fibers of silk are drawn from the cocoons and wound upon the bobbins after receiving the proper degree of twist by the bobbins revolving faster or slower than the spindles and fliers or cylinders, which effect is produced by the bands that operate the bobbins and spindles with fliers or cylinders. The bands run in the grooves of the whirls, one of which is fastened to the bobbin and the other to the spindle. The cocoons that become tangled are prevented from rising up to the first guide by several pointed wires that are placed just below in the form of a man's hand open with the fingers slightly bent. The wires or fingers are far enough

apart for the fibers of silk to pass readily between, but will not suffer the cocoons to, and thus prevents the tangled fibers from being twisted with the others and breaking the end or thread of silk.

This machine may be operated by the foot of the tender or by steam or water or any other power.

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

A A of the accompanying drawing, No. 1, is the side sills of the frame; B B, the front and back sills; C C, the front posts; D D, the middle and E one of the back posts. The other is seen in drawing No. 2, Fig. 1. (The letters in this specification refer to drawing No. 1 and the figures or numbers to drawing No. 2.) F and 2 the plate upon which the spindle box G and 3 is secured; H H and 4, two short girts framed into the front and middle posts and supports the front cross girt I upon which is one bearing of the main shaft, as 5 in the drawing No. 2 shows the end of the girt with the bearing upon it without the box. The other bearing is upon the back girt, which is framed into the back posts. One end is seen at 6 with the box the shaft runs in upon it. The two front posts have the cleat J and 7 fastened to them. The other cleat is shown at 8, fastened to the middle posts for the sheet iron under the boiler to lie upon.

K is the treadle rack (for the foot of the tender when it is operated by the tender) supported by a rod. One end is seen at 9, passing through the side sills and the cleats of the rack 10. The rack has the arm L and 11 fastened to it by a leather strap 12. At the upper end of the arm there is a hole through which the stud M and 13 is secured into the crank 14. Upon the main shaft 15 in front of the large pulley N and 16 upon the main shaft, there is an endless screw 17 that turns the toothed wheel 18 upon the cross shaft. One end is seen at 19, the bearings of which are in two stands fastened to the middle posts. Upon the side of the wheel there is an eccentric 20 that runs between two pins in the lever 21, the fulcrum of which is the shaft 22. The bearings of this shaft run in the stand O and 23. (The stand which the shaft 19 runs in is like the stand O.) The shaft 22 is the fulcrum of two more levers 24, the ends of which work

easily in two holes through the wooden traverse rail 25, that slides upon two rods 26, that run across the spindle box parallel with the spindles, but far enough below so as not to interfere with the bobbins P and 60. Upon this traverse rail there is a metal slide for each of the bobbins. One end 27 is bent up at right angles to the other part, which is fastened to the traverse rail. The turned up part projects into the groove R²⁸ between the head S²⁹ and the whirl T³⁰ of the bobbin, so that as the eccentric moves the first lever and the second lever the rail and slide it moves the bobbins also and winds the silk uniformly upon the whole length of the bobbin between the heads S and 29 and U. The head in the drawing No. 2 is obscured by the cylinder.

V and 33 the boiler; W, the door; X, the plate of metal or sheet iron that is under the whole length of the boiler and turns up at the end 34 and is fitted to receive the funnel 35 to carry off the smoke. Above the plate *x* there is a grate. The under part of the boiler is made with a cavity through its whole length. This cavity may be made square, circular or of any other form, plain or fluted, to increase the surface for the action of the fire. In this cavity and upon the grate the fire is made to heat the water in the boiler, and the smoke passes out through the hole in the plate that stops the end of the cavity under the boiler into the funnel that conveys it away. Y and 36, a metal strainer that just fits into the boiler. (It is shown in the drawing No. 2 with part of the end of the boiler off and the end of the strainer off also, so as to show the partition.) This strainer prevents what remains of the cocoons that the silk is spun off from sinking and to remove the cocoons from the water when the spinning is stopped. This strainer has two movable partitions Z, Z, and 37 to keep the cocoons for each spindle separate from the others. The fibers of silk from the cocoons pass up between the pointed wires *a* and 38 (of which there are 5 pointed and two with the ends rounded and turned out to receive the fibers of silk from the hand of the operator more readily,) through the guide *b* and 39, where it receives the required degree of twist, and then passes into the end of the spindle *d* and 40 and out through the side of the spindle (41 of drawing No. 3 of a spindle complete, showing the thread passing in through the hole and out over the hook 42 through the querl at the end of the flier arm 43 onto the bobbin) over the hook *e* and through the querl *f* onto the bobbin P, upon which it is wound by the spindle and flier or cylinder revolving faster or slower than the bobbin. The spindle is carried by the band *g* and 42 from the large pulley N and 16 running over the whirl *h* and 61 upon the first spin-

dle and under the second and over the third, under the fourth and over the fifth onto the large pulley N, also a section showing the band whirl and pulley. This large pulley is made sufficiently heavy to serve for a fly wheel and pulley. It has several grooves in it of different sizes to vary the twist as it may be wanted. The band *i* and 44 runs in one of these grooves and then into a groove in the whirl T and 30 of the first bobbin and under the second, and so on the same manner as the band runs that carries the spindles.

There are metal cylinders or tubes upon part of the spindles as at *j* and 45 in the drawing open at one end and large enough for the bobbin to pass in and out freely. There is a hole 46 in the hub of the cylinder that corresponds to the one in the spindle. It is represented in the drawing No. 2 with the side of the spindle left off, so as to show it plainly where the silk passes out and then along the side of the cylinder through a notch onto the bobbin. The air does not resist this cylinder when it revolves so much as it does the flier and it is not liable to spread like the flier when it revolves fast. Therefore it can be run much faster with less power.

The guide *b* and 39 and the pointed wires *a* and 38 are all fastened to the slide *k* and 49, which may be drawn out or shoved in at pleasure. This slide is shown in drawing No. 2 shaded darker than the rest of the spindle box, also a section of it to drawing No. 1.

As the spindles are all carried by one band and the bobbins are all carried by another and the bands running under some and over others it makes part of them revolve in one direction and part in the opposite and makes the spindles that do not revolve in a proper direction to spin revolve in a proper direction to double and twist that which has already been spun. The bobbins that are filled with spun silk are taken from the spindle by unscrewing the nut that holds the whirl and slipping off the whirl and bobbin of silk that is to be doubled and twisted, which bobbins are put upon skewers (the ends of the skewers may be seen projecting out of each end of the bobbin 50) and set in the creel *l* and 51 under the spindle box. The threads pass through a guide to the top of the pulley *m* and 52 and around the pulley and over the glass rod *n* and 53 into the end of the spindle. In drawing No. 2 the end of the spindle box is left off and the spindle is shown open with the thread in it and one of the pieces that support the glass rod and the bearing of the pulley, so as to show the pulley and thread as it is conducted onto the bobbin. One edge of the pulley *m* and 52 runs in the basin of water *o* and 54 to wet

the strands of silk before they are twisted. Upon the side of the pulley *m* and 52 there is a smaller one upon which the wire hook 55 hangs that holds the weight *p* and 56, 5 which may be made heavy to produce any required degree of friction.

Upon the back end of the main shaft, opposite the crank, there is a fast and loose pulley 57 for the belt when it is operated 10 by steam, water or any other power except the foot of the tender.

The two outside spindles and the middle one may be taken out by lifting up the end where the whirl is and pulling them out. 15 The other two may be taken out by removing the block *q* *q* and 58 and moving them

a little one side before lifting them up, when they may be drawn out as the others were.

What I claim as my invention and desire to secure by Letters Patent is— 20

1st, the combination of the fliers and spindles with the guides and bands of pointed wires, and 2nd the wheel (to which friction is applied) over which the silk passes in doubling and twisting in combination with 25 the macerating cup and with the flier and spindle, all as above described.

JONATHAN DENNIS, JR.

Witnesses:

BENJAMIN ARNOLD,
JAMES G. ARNOLD.