

(Model.)

3 Sheets—Sheet 1.

F. SEYMOUR & A. BANNIGAN.

MACHINE FOR SPINNING, DOUBLING, AND TWISTING SILK.

No. 282,123.

Patented July 31, 1883.

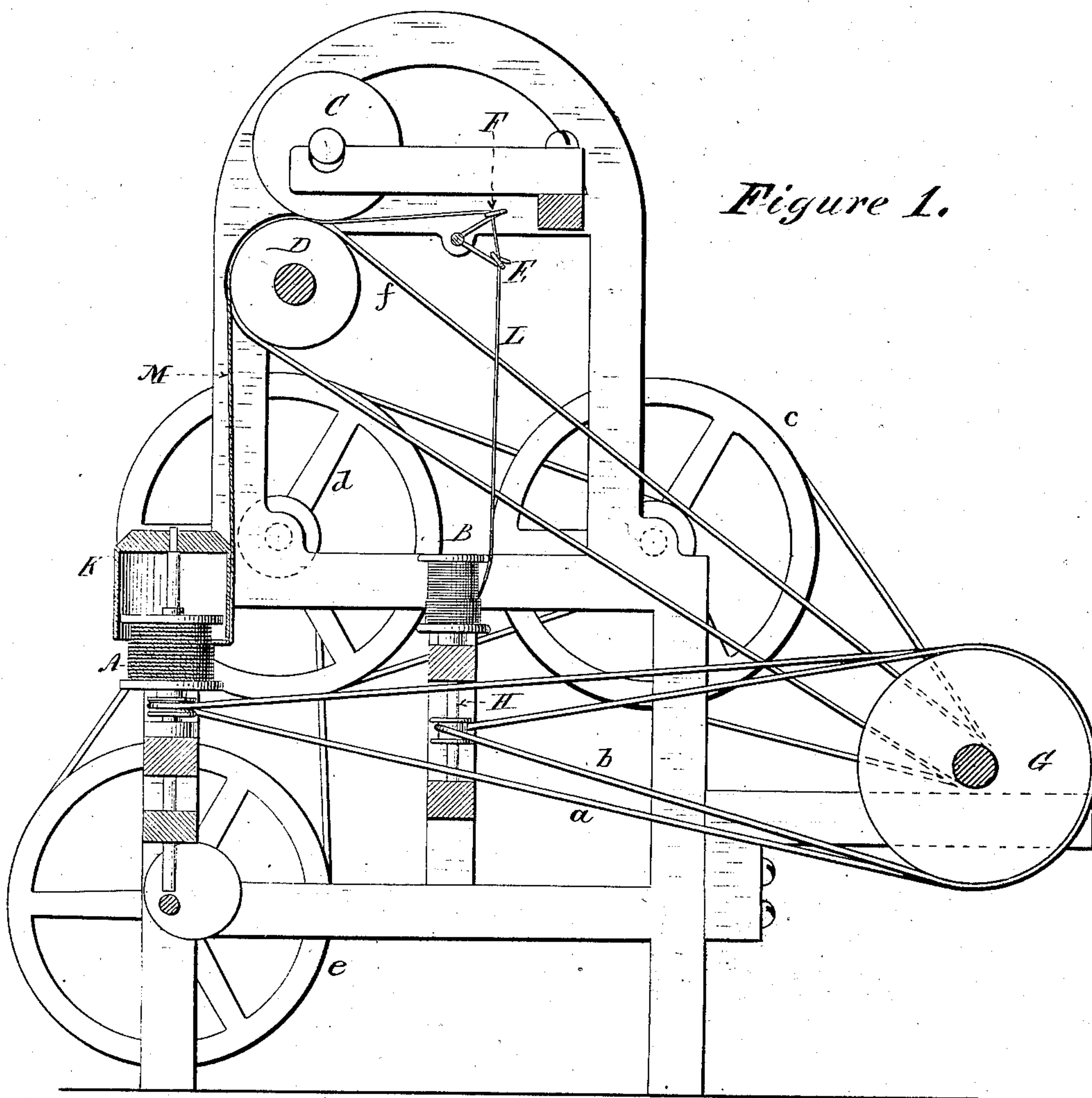


Figure 1.

Witnesses:

William Barton  
A. E. Hansmann.

Inventors:

Frances Seymour  
Augustus Bannigan  
By their Attorney  
Charles E. Fother

(Model.)

3 Sheets—Sheet 2.

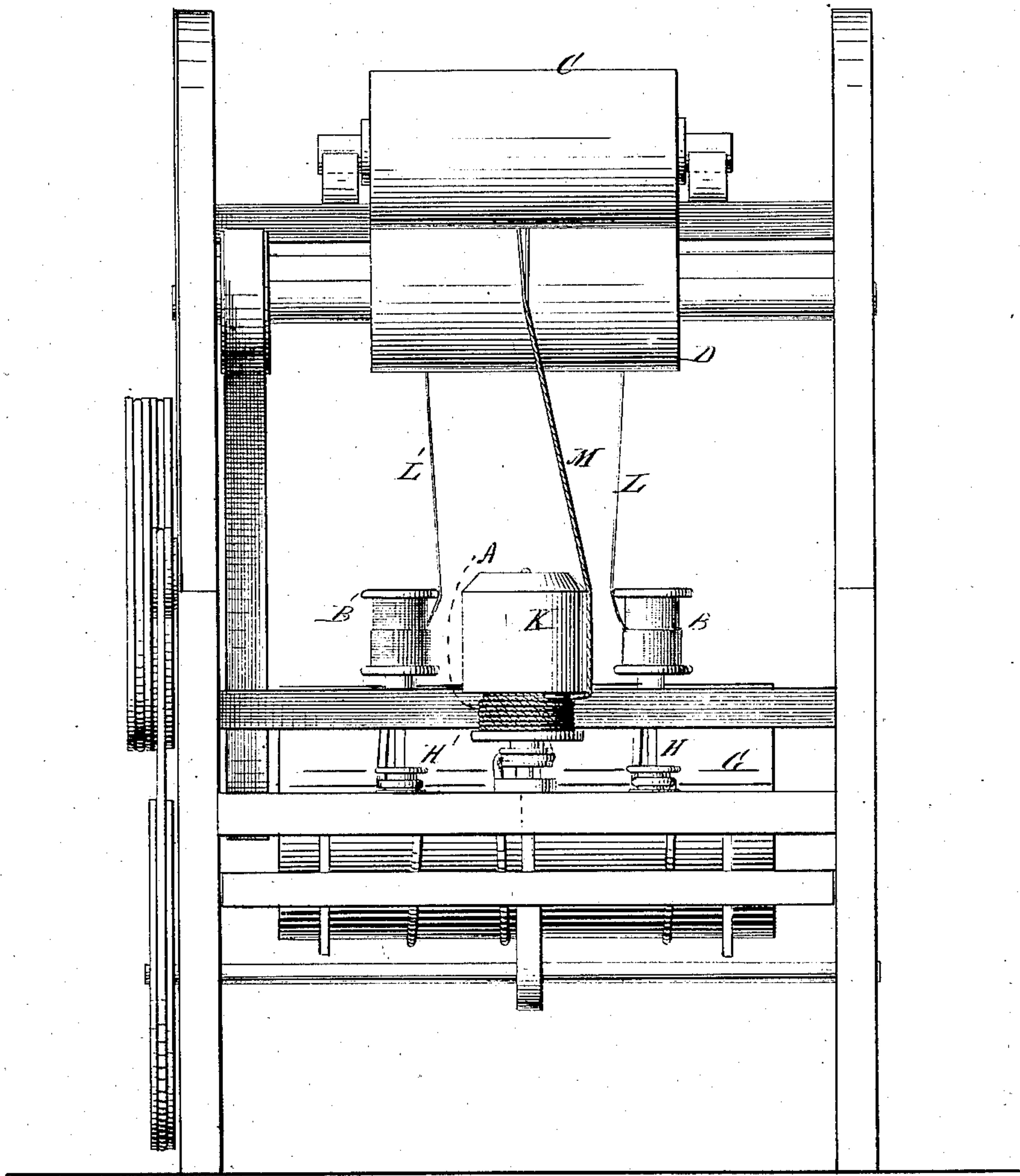
F. SEYMOUR & A. BANNIGAN.

MACHINE FOR SPINNING, DOUBLING, AND TWISTING SILK.

No. 282,123.

Patented July 31, 1883.

*Figure 2.*



Witnesses:

William Patton  
H. E. Hansmann.

Inventors:

Francis Seymour,  
Augustus Bannigan,  
By their attorney,  
Charles E. Foster

(Model.)

3 Sheets—Sheet 3.

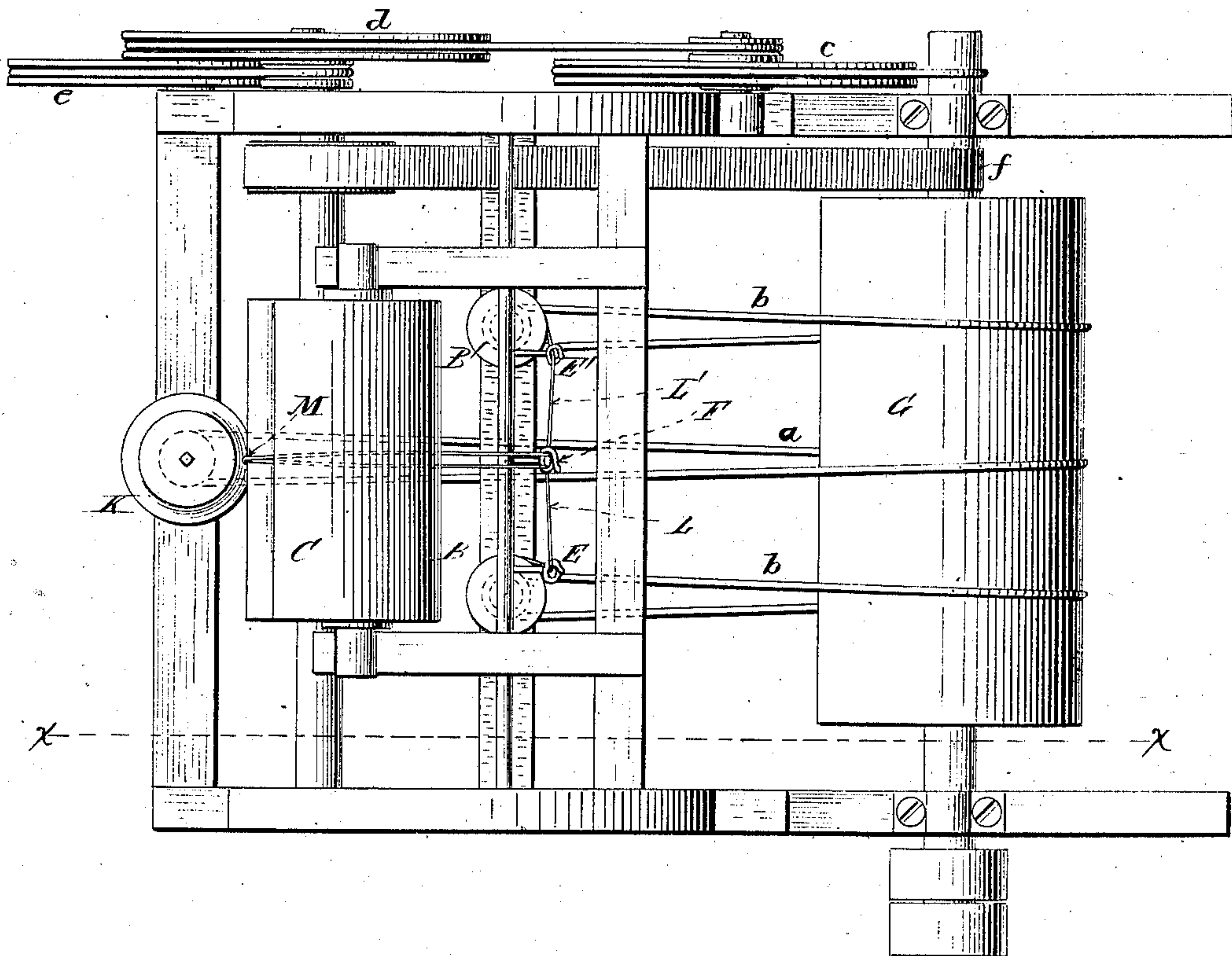
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MACHINE FOR SPINNING, DOUBLING, AND TWISTING SILK.

No. 282,123.

Patented July 31, 1883.

*Figure 3.*



Witnesses:

*William Gator*

*J. E. Hansmann.*

Inventors:

*Francis Seymour*

*Augustus Bannigan*

*By their attorney*

*Charles E. Foster*



# UNITED STATES PATENT OFFICE.

FRANCIS SEYMOUR AND AUGUSTUS BANNIGAN, OF PATERSON, NEW JERSEY;  
SAID BANNIGAN ASSIGNOR TO SAID SEYMOUR; SAID SEYMOUR ASSIGNOR  
OF ONE-HALF TO RICHARD ROSSITER AND SAMUEL THORP, OF SAME  
PLACE.

## MACHINE FOR SPINNING, DOUBLING, AND TWISTING SILK.

SPECIFICATION forming part of Letters Patent No. 282,123, dated July 31, 1883.

Application filed August 7, 1880. (Model.)

*To all whom it may concern:*

Be it known that we, FRANCIS SEYMOUR and AUGUSTUS BANNIGAN, of the city of Paterson and State of New Jersey, have invented a new and useful Machine for Spinning, Doubling, and Twisting Silk in one Operation, of which the following is a full, true, and exact description, reference being had to the accompanying drawings.

10 In order that the silk filament as it is received from the producer be put into a condition to be used in the manufacture or weaving of silk, it is necessary that three operations be done to it. In the first place it is necessary that such filament be twisted on itself; or, as

15 is commonly called, "spun;" secondly, it is necessary that two or more of such spun filaments be laid together. This operation is called "doubling;" and, in the third place, it is necessary that the spun filaments so laid together

20 be again twisted or spun, generally the reverse way from which they were previously spun or twisted. These successive treatments of the silk filaments and their conversion into a single thread are called the "throwing" of the

25 silk. These operations, as hitherto practically carried on, have been performed in most instances separately and upon separate machines, thereby necessitating great loss in time and the

30 expenditure of considerable unnecessary manual labor. The first of these operations, as usually carried on, is performed in a machine in which a single silk filament is spun and then wound up upon another spool. The second

35 operation, as usually carried on, has been done in a machine in which two or more of the spools containing the single spun filaments have been placed, and those filaments have then been laid together and wound up upon another spool

40 without twisting; and the third operation has been performed in another machine, in which the final spinning was performed upon the double filaments so laid and wound up on the second machine.

45 It has been proposed heretofore to spin, double, and twist yarns in a single machine wherein the yarns were unwound from bobbins, passed through travelers or fliers, thence

through eyes to and around a feed-roller, and finally the doubled yarns or cord passed to another ring-traveler, being then wound upon a bobbin. It has also been proposed to spin filaments from spools or bobbins and spindles provided with enlarged heads, the spun filaments being passed over rods and through a doubling-eye, and then wound upon a spool by means of a flier-spindle. These arrangements are not, however, practical for spinning, doubling, and twisting the fine filaments of silk, for the reason that the ring-travelers produce so much tension upon the fiber that it is very liable to break, and, owing to the peculiar nature of the silk filaments, they very soon cause the iron rings or guides to become notched and uneven, thereby adding to the danger of breakage. Moreover, the fliers are comparatively complicated and expensive, and, further, owing to the nature of their construction, they cannot be driven at high rates of speed, and as a consequence cannot be economically employed in throwing silk.

To avoid these difficulties is the object of our invention; and to that end our invention consists in combining in one machine means, substantially as hereinafter described, for performing the operations of spinning, doubling, and twisting the filaments of silk without liability of breaking them.

In our apparatus we use two sets of spools—namely, those upon which the filaments are received and those upon which the completed thrown silk is finally wound, which last spool or set of spools is provided with a spinning cap or caps, and, as will be explained, makes part of the spinning contrivance for giving to the double filaments the second spinning which they require.

Our apparatus will be readily understood from the accompanying drawings, of which Figure 1 represents a sectional elevation through the line XX, Fig. 3, showing the operative parts; Fig. 2, a front view of the machine, showing the operation of spinning, doubling, and twisting in detail; and Fig. 3, a top or plan view of our apparatus.

Our apparatus is shown as spinning two fila-



ments, doubling them, and twisting; but it is plain that it is applicable to the spinning, doubling, and twisting of any desired number of filaments, and that a great number of spools can be substituted for those shown and driven from the same mechanism.

Similar letters refer to similar parts in all the figures.

B B' represent the spools upon which are wound the filaments to be operated upon. These are placed upon suitable spindles, H H'. The filaments L L' are simultaneously unwound from and spun by the open spools B B', and pass upward from them. As shown in the drawings, they pass, respectively, through eyes E E', and thence through the single doubling eye F. The double filament then passes between the feed-rolls C D, and thence downward to the spinning-spool A, provided with a suitable spinning-cap, K. The rotation of the spool A both spins and winds up the double filaments L L'; which, when doubled, are marked M, as shown in the drawings. The cap and spool K A are preferably of the form known as the "Danforth Cap." By this arrangement the rising-and-falling motion of the cap A properly winds the doubled and twisted thread M upon the spool in successive layers. The cap K is raised and lowered by the dead-spindle, and does not rotate while the spool rotates within it. The result of this operation is that the thread M is continually moving around the lower periphery of the cap, and does not continually pass through one eye, as is the case in a ring traveler or flier. As shown in the drawings, the spools, rollers, and caps are driven from the power-shaft G by suitable belts.

a represents a belt passing around the power-shaft G and the spindle of the spool A. b b represent belts passing around the power-shaft G and the spindles H H', carrying the spools of unspun silk.

c d e represent speed-reducing pulleys, provided with suitable belts for operating the traverse for the winding-spool. f represents a belt connecting the feed-roll d to the main driving-shaft. Provided the apparatus be properly speeded and driven, the exact method of driving the parts is immaterial, and the connections may be varied to meet the exigencies of each construction. The particular method of bringing the filaments together is also immaterial.

From the above description it will be seen

that our improved machine consists in a combination of old devices never before brought together, and that by means of it the silk is spun, doubled, twisted, and wound upon the spools in one continuous operation. The principle of our invention consists in unwinding from two or more spools filaments which are then spun while traveling around circular edges or surfaces above the bodies of the spools. As shown, the said surfaces are the edges of the disks constituting the upper ends of the spools. These spools therefore serve the purpose of unwinding the filaments and simultaneously spinning them. From them the filaments are laid together by suitable contrivances, and, passing over suitable drag-rollers, they are then brought down to a single spinning cap, which is also provided with a circular spinning-surface, when the twisted filament is wound upon the bobbins, the continuous surface of the cap preventing any uneven wear and consequent breaking of the filaments. By means of this combination of devices we are able to produce a machine capable of practically throwing the finest silk filaments without danger of breaking.

What we claim as our invention, and desire to secure by Letters Patent, is—

1. The combination, with two or more spindles for carrying the threads of unspun silk, each provided with a disk at its upper end, and feed-rollers, of a spinning or twisting spindle, a cap, and mechanism for operating said parts, whereby the strands of unspun silk as they leave the spindles are twisted by coming in contact with the said disk and the two strands are doubled and twisted together, substantially as described.

2. The combination of two or more spindles, two or more spools thereon, carrying threads of unspun silk, having disks around which the threads are spun, and devices for bringing the threads together, with a spinning and twisting spindle, a cap, and mechanism for operating such parts, whereby the strands of silk as they leave the spools are spun around the disks or edges of the spools, and are doubled, twisted, and laid upon the latter, substantially as described.

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AUGUSTUS BANNIGAN.

Witnesses:

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