(No Model.) 3 Sheets—Sheet 1.

JOSEPH NIGHTINGALE & JOHN NIGHTINGALE.

QUILLING MACHINE.

No. 348,336. Patented Aug. 31, 1886.

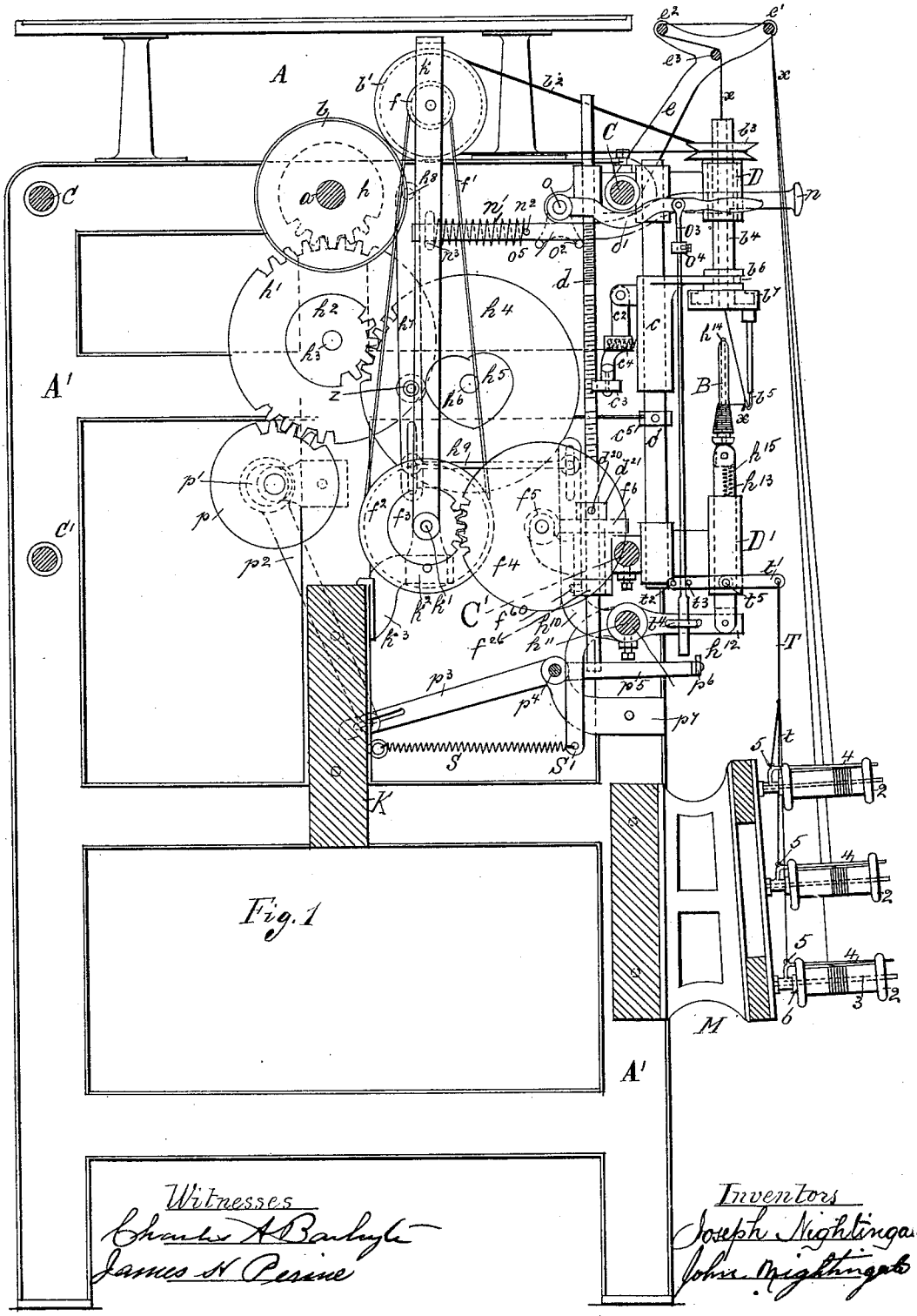


Fig. 1

Witnesses
Charles A Barlow
James A Perine

Inventors
Joseph Nightingale
John Nightingale

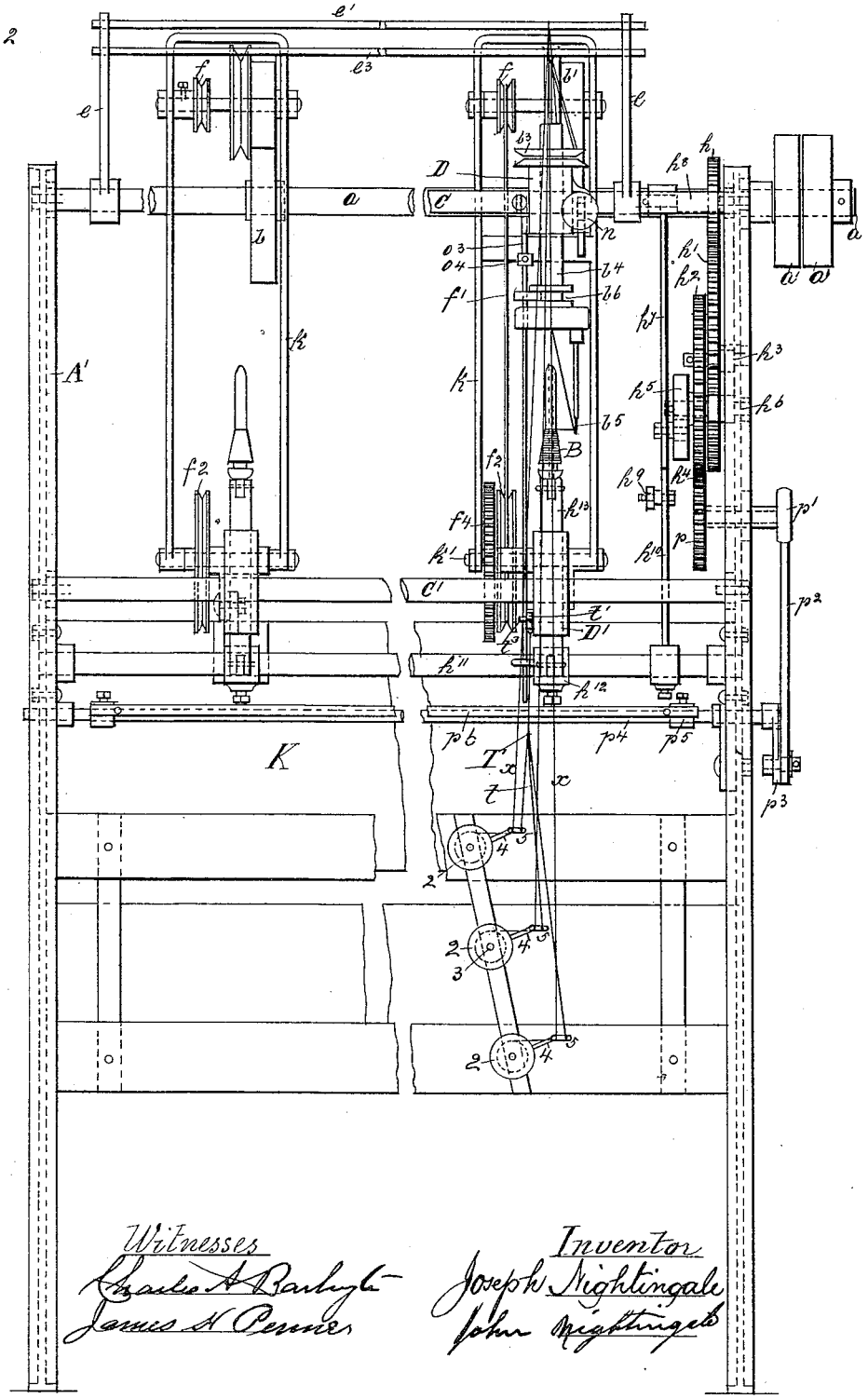
(No Model.) 3 Sheets—Sheet 2.

JOSEPH NIGHTINGALE & JOHN NIGHTINGALE.

QUILLING MACHINE.

No. 348,336. Patented Aug. 31, 1886.

Fig. 2



Witnesses
Charles A. Barlow
James A. Penner

Inventor
Joseph Nightingale
John Nightingale

(No Model.) 3 Sheets—Sheet 3.

JOSEPH NIGHTINGALE & JOHN NIGHTINGALE.

QUILLING MACHINE.

No. 348,336. Patented Aug. 31, 1886.

Fig. 3

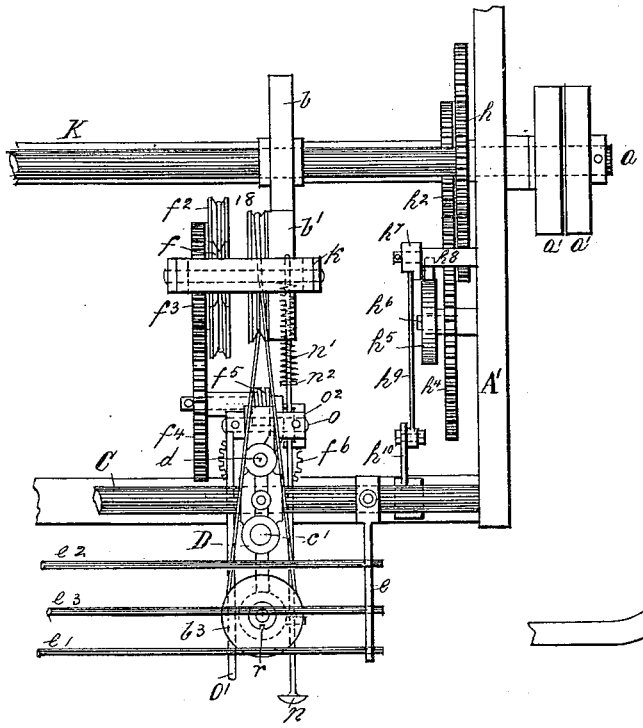


Fig. 4

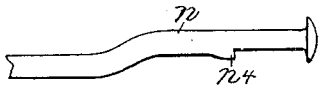
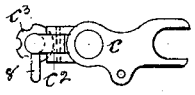


Fig. 5



Witnesses
Charles A Barbyle
James H Peirce

Inventors:
Joseph Nightingale
John Nightingale

UNITED STATES PATENT OFFICE.

JOSEPH NIGHTINGALE AND JOHN NIGHTINGALE, OF PATERSON, N. J.

QUILLING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 348,336, dated August 31, 1886.

Application filed February 9, 1886. Serial No. 191,287. (No model.)

To all whom it may concern:

Be it known that we, JOSEPH NIGHTINGALE and JOHN NIGHTINGALE, citizens of the United States, residing at Paterson, Passaic county, State of New Jersey, have invented a new and useful Improvement in Quilling-Machines, of which the following is a specification, reference being had to the accompanying drawings, forming a part thereof.

The object of our invention is to provide a quilling-machine of new construction wherein the threads or filaments are doubled and wound on the quill in one and the same operation. We attain these objects by the devices illustrated in the accompanying drawings, which will be hereinafter explained and claimed.

Figure 1 of the drawings shows one end of the machine in elevation, in which figure the doubling and quilling devices of one side of the machine are shown, the rods, rail, and portions of the jack-frame being in section. Fig. 2 shows the front of the machine in elevation, in which figure the transverse parts are broken out at the middle of the machine, one of the sides of the figure showing a portion only of the devices. Fig. 3 is a part plan of the machine, in which figure a portion of the frame tension-rods, &c., are removed. Fig. 4 is a detail view of a part of the stop-bar, and Fig. 5 shows in elevation the threaded disk, spring, &c., detached.

A represents a quilling-machine having the usual frame, A′, on and to which frame are arranged and secured devices, as follows:

In suitable bearings that are arranged in the upper part of the frame A′ is journaled a driving-shaft, *a*, having driving and loose pulleys *a′ a′* on one end of the same, and also provided with a gear-wheel, *h*, and a friction-wheel, *b*. The wheel *h* gears with a gear-wheel, *h′*, having a pinion, h^2, both wheel and pinion being journaled on a stud, h^3, secured in the frame A′. The wheel *h′* meshes with and turns a gear-wheel, *p*, arranged in a bracket secured to the machine-frame, while the pinion h^2 gears with and turns a gear-wheel, h^4, journaled on a stud, h^6, and having a cam, h^5, while the stud is secured in the frame A′.

On a stud, h^8, that is secured in the frame A′, is pivoted a lever, h^7, having a slotted lower end, and having arranged centrally thereon a roller, *z*, to engage the cam h^5, by which the lever h^7 is actuated.

To the lever h^7, in the slot thereof, is secured adjustably a link, h^9, the opposite end of which is secured to a curved slotted lever, h^{10}, in the slot thereof, and is adjustable therein, while the lever h^{10} is arranged on a rock-shaft, h^{11}, and is secured to said shaft by means of a set-screw. The rock-shaft h^{11}, which is journaled in the opposite sides of the machine-frame, is provided with a lever, *s′*, to the end of which is secured a spring, *s*, the opposite end of the spring being fastened to the rail *k* by means of an eye-screw. The outer end of arm h^{12}, arranged on shaft *h*, has pivoted to it a transverse spindle, h^{13}, which spindle is arranged in a sleeve-bracket, D′, arranged on and secured to a rod, C′, by means of a set-screw. The upper end of the spindle h^{13} is made separate and is pivoted to the body of the spindle, so as to be pulled forward from under the winding-tube, to take off and put on quills, while the body of the spindle is provided with a spring, h^{15}, to force the top of the spindle back in erect position.

In a sleeve-bracket, D, secured on the rod C at the top of the machine, is arranged a tube, b^4, and a whirl, b^3, that surrounds the tube and which turns the same by means of a feather that is arranged in the whirl, and which enters a groove, *r*, in the tube b^4. The lower end of the tube b^4 is provided with a disk, b^7, having in the hub portion of the same a circumferential groove, b^6, and on the lower disk-surface of the same a guide-arm, b^5, and centrally an orifice for the thread to pass through the same while the guide-arm revolves around the spindle. The whirl b^3 connects with a pulley, 18, by the side of a friction-wheel, *b′*, by means of a band, b^2, and is actuated thereby. The wheel *b′* is arranged on a shaft that journals in a frame, *k*, and is so arranged as to be brought into frictional contact with the friction-wheel *b*, by which the wheel *b′* is turned. There is arranged in the sleeve-brackets D and D′ a guide-rod, *c′*, and a threaded rod, *d*. On the guide-rod *c′* is arranged a slide, *c*, the outward-projecting part of which slide is arranged in the circumferential groove b^6 of the disk on the tube b^4, and conforms to the hub portion of the

disk in the groove b^6 thereof. The slide c is provided with an inward-projecting lug, to which lug is pivoted a depending arm, c^2, on the lower end of which arm is arranged a differential screw-disk, c^3, having a handle, 8, by which the disk is turned. The arm c^2 is provided centrally with an enlarged part, in which is arranged a spring, c^4, to hold the disk in engagement with the rod d, while the rod c' is provided with a collar, c^5, to limit the downward movement of the slide c. The rod d, which has screw-threads of different size arranged thereon, is provided with a worm-wheel, f^6, that gears with a worm, f^5, by which means the rod d is revolved. This rod is adjustable in the brackets D D', and is held to its adjustment by means of a collar, d^{21}, and set-screw d^{20}, and of the worm-wheel f^6 and the collar f^{26}, secured upon the sleeve thereof below bracket D' by the set-screw f^{60}, that engages the bracket D', as shown in Fig. 1. The worm f^5 is actuated by the wheel f^4, that gears with a gear-wheel, f^3, journaled on a stud, k', which last-mentioned wheel is turned from the pulley f by means of a band, f', that connects with the said pulley f and a pulley, f^2. The frame k, in which the pulley f is arranged, is pivoted on stud k' at its lower end, while the said stud k' is arranged in brackets k^2, which are fastened to other brackets, k^3, that are secured to the rail k, which rail is secured to the machine-frame.

On the hub or sleeve portion of the gear-wheel p is arranged and secured an eccentric, p', to which is arranged an eccentric-rod, p^2. The rod p^2 connects with a slotted lever, p^3, by a pin in the slot thereof, and is adjustable therein. The opposite end of lever p^3 is arranged on a rock-shaft, p^4, journaled in the different sides of the machine-frame. There is arranged on the shaft p^4 a stop-lever, p^5, on the end of which lever is arranged an upward-projecting lug, p^6, to engage and actuate a stop-rod, o^3. The rod o^3, which is provided with a collar, o^4, is pivoted to a lever or handle, o', and passes through an opening in a balance-lever, t', between pins t^2 t^3 thereof, and is arranged in a guide, t^4, on the lever h^{12}. The said balance-lever t' is pivoted to the sleeve-bracket D' on a pivot, t^5, and has arranged in the end of the same a textile tie-cord, T.

To the cord T are fastened trip-cords t, each one of which cords is fastened in the eye 5 of a tension-arm, 4, that is arranged on a jack-pin having a collar, 6, the arm 4 running in line with said jack-pin to the end thereof. The jack-pins are arranged in the jack-frame M, secured to the machine-frame.

On the rod C, near the top of the machine, are arranged brackets e, having tension-rods e' e^2 e^3 arranged thereon to support the threads x. The rod e^3 is arranged directly over the tube b^4, through which the thread passes to the spindle and quill. The draw-bar n, which is provided with a catch, n^4, has arranged thereon a spring, n', and a pin, n^2, and is attached to the free end of the frame k, to actuate the said frame to engage and disengage the friction-wheels b and b'. The catch n^4 has arranged therefor a suitable stop for the action of the catch to hold the wheel b' in frictional contact with the wheel b, while the bar n rests on the pins o^2, arranged in a lug or dog, o^5, attached to the lever or handle o'. The strands or filaments x are taken from their respective bobbins 2 under the tension-arms 4, upward to the tension-rods, over the rod e', over and partly around the rod e^2, to and over the rod e^3, down through the orifice of the tube b^4 and disk to and through the eye b^5, where the strands or filaments are brought together and doubled, and the doubled thread taken to the quill B and secured thereto. The driving-shaft a having been put in motion by the usual means, and the feeding devices by the frictional contact of the wheel b' with the wheel b, the operation is as follows: The tube b^4, which is in rotation by means of the guide b^5 as the guide revolves around the quill B, which does not revolve, winds the doubled thread on the quill, which action unwinds the threads or filaments from the bobbins 2, and winds the same doubled on the quill B, which quill is moved up and down by the spindle h^{13}, actuated by the transverse mechanism to have the thread laid evenly thereon, while the threaded rod d, which is in rotation by means of the threaded disk c^3, moves upward the slide c, and by means of said slide moves upward the tube b^4 through the whirl b^3 to lay the doubled thread evenly on the top of the quill. When, during the unwinding of the threads or filaments from their respective bobbins 2 and winding them doubled on the quill B is continued, a thread breaks, the arm 4 of the broken thread is left without support, and falls from its elevated position and jerks the trip-cord t of its own connection, which action jerks the tie-cord T and pulls down the outer end of the balance-lever t', which action raises the inner end of the said lever t' and causes the pin t^2 to engage the stop-rod o^3 and carry the same out into engagement with the lug p^6, which then forces the rod o^3 upward, raising the lever or handle o', which action, by means of a pin, o^2, raises the outer end of the draw-bar n, freeing the catch n^4 from its catch-connection. Then the spring n^2, which is compressed and in tension, forces out the draw-bar n, which bar in its outward motion carries with it the frame K, removing thereby the wheel b' from frictional contact with the wheel b, stopping thus automatically the feeding devices and the further feed of thread. When the thread is restored, the tension-arm 4 is elevated and the balance-lever t' placed in balanced position, which action, by means of pin t^3, moves the rod o^3 from its engagement with lug p^6, when the rod o^3 and handle o' descend by gravity, which action permits the bar n to be pushed into its catch-connection, which contracts the spring n' and forces the wheel b' into its frictional contact with the wheel b, which starts the devices and the further feed of thread, and

puts the devices in position for automatic action. As the winding of the doubled thread on the quill B proceeds, the spring h^{15} holds the upper pivoted portion of the spindle h^{13} in erect position, while the spring s acts to prompt the downward movement of the spindle h^{13}. When the quill B has attained its full size by the winding of the doubled thread thereon, the slide c will have been carred upward on the threaded rod d to engage the collar o^4, and by means of said collar raise the rod o^3 and lever or handle o', and by means of pin o^2 raise the draw-bar n until the catch n^4 is raised above its catch-connection, when the spring n^2 will force outward the bar n and frame k, and thus disengage the friction-wheels b' and b, which stops the feeding devices. The differential threads on the rod d and disk c^3 are used to cause the upward movement of the slide c and tube b^4 more or less rapid, to suit the coarseness or fineness of the thread to be wound on the quill. The rod, which, as already explained, is adjustably arranged in the brackets D D', can be raised or lowered to put the different threads in position to be engaged by the disk c^3—that is, turned into proper position by the handle 8 thereof. The slide c having been raised to the collar o^4, and the quill having been filled, the top of the spindle is pulled forward, the finished quill removed, and another and empty quill put thereon. When this is done, the spring h^{15}, which is in tension, forces the top of the spindle back into erect position, and holds the same erect, after which the handle 8 of the disk c^3 is pulled outward, which compresses the spring c^4 and permits the arms c^2 to recede, and thus disengage the disk c^3 from rod d, when the slide c and tube b^4 slide down to the collar c^5 to their lowest and starting positions. Any practical number of spindles may be arranged on the machine and operated at the same time.

Having described our invention, we claim as new, and desire to secure by Letters Patent—

1. The combination, with the tube b^4, provided with a disk, b^7, guide b^5, and whirl b^3, for turning the tubes and disk, of the bracket D, the rod C for supporting the bracket, the frame A', the friction-wheel b', the band b^2 for turning the whirl, the frame k, the stud k', the wheel b, and mechanism for turning wheel b, whereby the guide is revolved around the quill, substantially as described, and for the purpose set forth.

2. The combination, with the revolving disk and tube, of the slide c, for raising said disk and tube, the arm c^2, the spring c^4, the disk c^3, the rod c', the brackets D D', the rods C C', for supporting brackets D D', the rod d, for engaging disk c^3, the wheel f^6, the worm f^5, for turning wheel f^6 and rod d, the wheel f^4, for turning worm f^5, the wheel f^3, the pulley f^2, the band f', for turning pulley f^2, the frame K, the stud k', the bracket K^2, the bracket k^3, the rail k, the frame A', the pulley f, and mechanism for turning pulley f, substantially as described.

3. The combination, with the guide b^5 and means for supporting and rotating the guide, of the jointed pivoted spindle h^{13}, the spring h^{15}, the sleeve-bracket D' for supporting the spindle, the rod C', the shaft h^{11}, the lever h^{10}, arm h^{12}, the link h^9, the lever h^7, the cam h^5, for actuating lever h^7, the wheel h^4, the wheel h^2, the wheel h', the wheel h, the stud h^3, the stud h^6, the frame A', and mechanism for turning wheel h, whereby the spindle is reciprocated vertically to have the thread laid on the quill, and the top of the spindle may be pulled forward to remove the quill, substantially as described.

4. The combination, with the spindle h^{13}, arm h^{12}, and shaft h^{11}, of the lever s', the spring s, for aiding the spindle's downward motion, the rail k, and machine-frame, substantially as described.

5. The combination, with the balance-lever provided with pins t^2 t^3 and cord T, of the cord t, the arm 4, the pin 6 for supporting arm 4 and a bobbin, the jack-frame M, the brackets e, the rods e' e^2 e^3, for supporting the thread and frame A', the tube b^4, the guide b^5, the whirl b^3, and mechanism for turning the whirls, the spindle h^{13}, link p^2, eccentric p', lug p^6, rod o^3, pins t^2 t^3, lever o', lug o^2, spring n', lever n, lever p^3, lever p^5, and shaft p^4, substantially as described.

6. The combination, with the lever t', of the rod o^3, the collar o^4, for engaging slide c, the slide c, the cord T, the cord t, the arm 4, the lug p^6, lever p^5, the shaft p^4, lever p^3, link p^2, eccentric p^7, the lever or handle o', the lug o^2, for raising lever n, the spring n', the pin n^2, the lever n, the frame K, the stud k', brackets k^2 k^3, the rail k, and machine-frame whereby the rod o^3 is thrown by the pin t^2 into engagement with the lug p^6, when a thread breaks, or is engaged by slide c when the quill has attained its full size, substantially as described.

7. The combination, with the rod o^3, of the lug p^6, for engaging rod o^3, the pin t^2, the lever t', cord T, cord t, the arm 4, lever o', lug o^2, the lever n, spring n', the frame K, the lever p^5, the lever p^3, the rod p^2, for actuating lever p^3, the shaft p^4, the brackets p^7, for journaling the rock-shaft p^4, the eccentric p', the wheel p, the wheel h', the wheel h, the frame A', and mechanism for turning wheel h, whereby the rod o^3 is engaged by lug p^6 and raised and the devices stopped when a thread breaks, substantially as described.

JOSEPH NIGHTINGALE.
JOHN NIGHTINGALE.

Witnesses:
CHARLES A. BARHYTE,
JAMES H. PERINE.