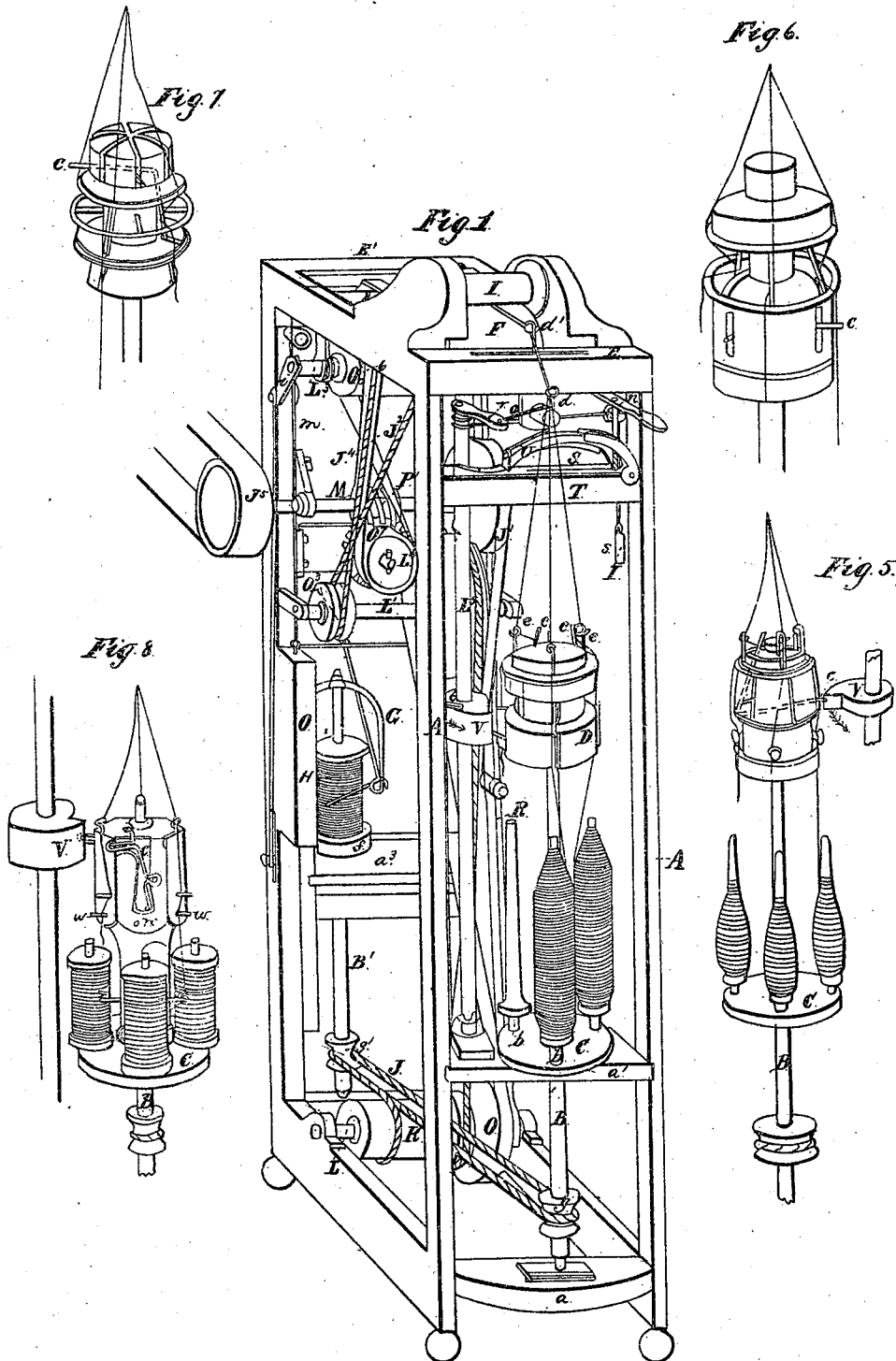


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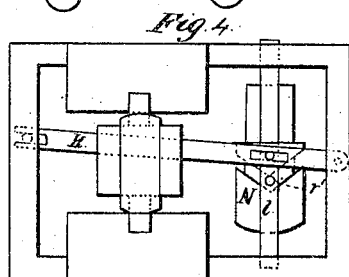
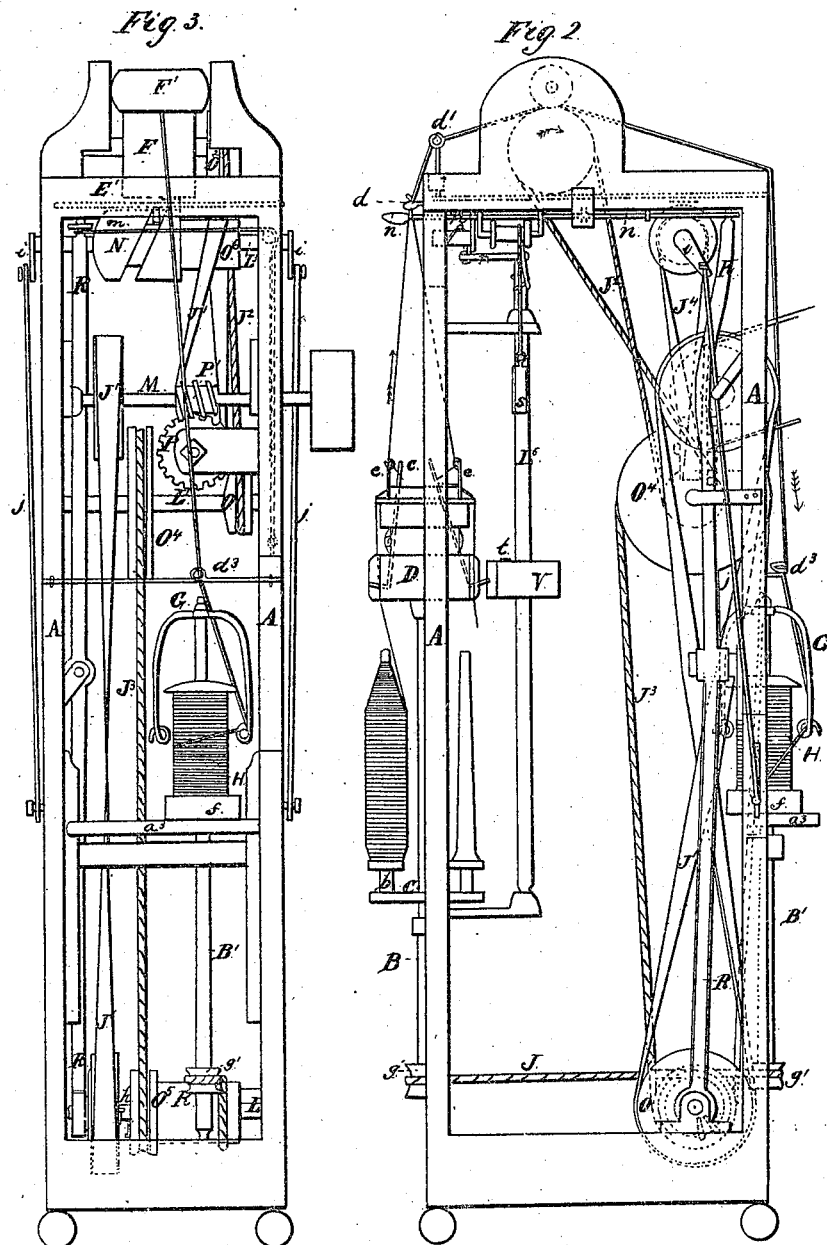
Machine for Doubling and Twisting Yarn

N^o 7, 701.

Patented Oct. 8, 1850.



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UNITED STATES PATENT OFFICE.

MOSES HEY, OF SPRINGFIELD, PENNSYLVANIA.

MACHINERY FOR DOUBLING AND TWISTING YARN.

Specification of Letters Patent No. 7,701, dated October 8, 1850.

To all whom it may concern:

Be it known that I, MOSES HEY, of Springfield, in the county of Delaware and State of Pennsylvania, have invented certain new and useful Improvements in Machines for Spooling, Doubling, and Twisting Yarns, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, which forms part of this specification, and in which—

Figure 1 represents a view in perspective of the machine employed by me, Fig. 2 is a side elevation of the same, Fig. 3 is a back elevation, Fig. 4 is a plan of the top, and Figs. 5, 6, 7, and 8 represent views in perspective of detached portions of my machine variously modified as hereinafter described.

My machine is constructed either to double yarns without any more twist than is necessary to keep the strands of the doubled yarn together or to give it a greater amount of twist as may be desired; it is also constructed in such manner that when the yarn of any one spindle breaks or runs out the machine will stop itself.

In the machine here represented the bobbins containing the yarn to be twisted are supported upon pins or standards projected upward from a disk secured near the lower end of a vertical spindle, to whose upper extremity the head is secured, by means of which the stopping of the machine is effected when any one of the yarns either breaks or runs out; from this head the yarns proceed through an eyelet to a pair of rollers, by the revolution of which the yarns are drawn from the bobbins as fast as the doubled yarn is twisted sufficiently to keep its strands together; this twisting is effected by the revolution of the spindle with its head, disk and bobbins; the yarn is conducted from the rolls to a bobbin and flier by means of which any additional amount of twist can be imparted to the doubled yarn.

In the accompanying drawing A represents the frame of the machine to which the other portions are secured; two transverse rails a , a' , are secured to the front of this frame, the lower one of these supports the step of a spindle B, and the upper one supports a bush through which the spindle is passed and by which it is maintained in an upright position. A disk C is secured to this spindle at a short distance above the bush and as many pegs b are projected from its upper surface as are necessary to sup-

port the greatest number of bobbins whose yarns are to be combined in a single cord.

To the upper extremity of the upright spindle B a head D is secured which contains the wires c by means of which the machine is stopped whenever any one of the bobbin yarns either breaks or runs out. The yarns from the bobbins are each passed upward on the outside of the head, round the upper extremities of the wires c , and thence through a separate eyelet e fixed to the crown of the head near its periphery; they are then all brought together and are passed through a common eyelet d projected from the upper rail of the frame; thence the compound thread is passed through a traversing eyelet d' , projected upward through a slot in the cap plate E of the frame; it is then passed between a pair of rolls F, F', mounted on the top of the frame, the lower roll F turning in fixed bearings and being driven, while the upper one F', whose journals are free to rise and fall in slots in the frame, rests upon the lower and is turned by the friction of its barrel upon that of the lower and the yarn passing between the two. After leaving the rollers the compound yarn is passed over the hinder cap plate E', of the frame and being turned downward is passed through a stationary eyelet d^3 whence it is conducted to a flier, G, and bobbin H of the usual construction, by means of which the requisite amount of twist is imparted and the yarn is wound upon the spool (H). The flier G is secured to the upper extremity of a spindle B' supported in an upright position at the back of the frame in a manner similar to the spindle B at the front of the machine. The spool H on which the twisted yarn is wound is placed upon this spindle and rests upon a movable rail a^3 to which a vertical reciprocating motion or traverse is given by means of which the cord is evenly distributed upon the spool; the motion of the latter is suitably retarded to wind the yarn by the friction of its base f upon a leather collet on the traverse rail a^3 . This arrangement for giving a double twist to the threads is that adopted when the compound yarn is to be hard twisted; when the yarn is to be twisted only to a sufficient degree to keep its strands together, a spool I (see Fig. 1) is substituted for the upper roll F' and the compound yarn is wound directly upon it. This spool is turned on its axis by the friction of the yarn on its barrel

upon the barrel of the driven roll F, and the even distribution of the yarn from one end of the spool to the other is effected by the traversing eyelet d' .

5 The two spindles B, B', are put in motion by means of a cord J or belt which encircling whirls g, g' , secured to them is passed round a drum K mounted upon a shaft L crossing the base of the main frame. A
10 belt pulley O is mounted loose upon this drum shaft and is connected with the drum by a clutch h the construction being such that when the belt pulley O is shoved toward the drum the claws of the clutch en-
15 gage with each other and the drum will revolve with the pulley; when the pulley O is drawn outward from the drum the clutch claws are disengaged and the drum will remain stationary while the pulley will run
20 loose upon the drum shaft. This belt pulley is put in motion by a belt J', encircling it and a corresponding pulley on the driving shaft M.

The driven roll F is put in motion by a
25 cord J² and belt pulleys O², O³, from an intermediate shaft L' which in turn is driven by means of a cord J³, and pulleys O⁴, O⁵, from the drum shaft L. The traverse eyelet d' is secured to a block sliding
30 in a groove sunk in the upper front cross bar of the frame immediately beneath the cap plate E, through a slot in which this eyelet is projected; this sliding eyelet block and the traverse rail a^3 are both moved by
35 the same shaft L³ which crosses the frame near its cap; the continuous rotary motion of this shaft is changed into the vertical reciprocating motion of the transverse rail by means of two equal cranks i and connect-
40 ing rods j ; the horizontal reciprocating motion of the eyelet block is imparted to it from the revolving shaft through the intervention of a lever k whose hinder extremity is moved by a pin r secured to the upper
45 side of a bar l which has a pin r' projected from its lower face into an oblique groove formed in a drum N secured to the revolving shaft L³; the front extremity of the lever k , is slotted to embrace a pin project-
50 ed from the lower face of the eyelet block. The shaft L³ is put in motion by a belt J⁴ and pulleys O⁶, O⁷, from a short intermediate shaft L⁴, having a worm wheel P secured to it which is driven by a worm P' secured
55 to the driving shaft M, to which the motion of the prime mover is imparted through the intervention of a belt J⁵, or in any other convenient manner.

It will be perceived from the foregoing
60 description that whenever the loose belt pulley O is in gear with the drum K, all those members of the machine which effect the progressive twisting of the bobbin threads and the spooling of the yarn are
65 put in operation and when this belt pulley

is out of gear with the drum these portions of the machine stop; hence to stop the twisting all that is necessary is to throw this belt pulley out of gear; the method of effecting this is as follows: The pulley O is secured to
70 a loose sleeve which is moved to and fro on the drum shaft by means of an upright lever R whose lower extremity is forked to embrace the sleeve and enter a ring groove sunk in its periphery; the upper extremity
75 of this lever is connected by a cord m with a weight (concealed in a case Q at the side of the frame) which is sufficiently heavy to shift the pulley on the drum shaft, thus throwing it out of gear with the drum. The
80 upper end of the upright lever is also passed through the hinder extremity of a horizontal lever n whose front extremity is slotted to embrace a pin projected upward from a
85 bar S sliding in a groove sunk in the upper face of the rail T; the upper surface of the sliding bar is notched, and a pawl U, is hinged above it, which bearing upon its
90 upper surface falls into the notch and secures the bar in its position. The pawl is connected by a cord o with an arm p projected from the upper extremity of an upright shaft L⁵ supported in bearings at the
95 front of the main frame; this shaft is also fitted with a cam V the radial surface of which is sufficiently near to the head D to be struck by the lower extremities of the
100 wires c when the latter are at their farthest distance from the center of the head. The cam V is held in its proper position by means of a weight s attached to a cord wound upon the shaft, acting in combina-
105 tion with a stop strap t secured to the cam; the weight tends to keep the cam in the direction indicated by the arrow while the stop strap limits the distance to which it
110 can be turned by the weight. The wires c are pivoted in slots sunk in the head, their upper extremities being passed through radial slots in the cap plate of the head, these
115 slots prevent the wires from assuming a vertical position but allow their upper extremities to fall inward toward the center of the head; the pivot is so placed that the
120 portion of the wire above it shall be the heavier, hence this upper portion will naturally tend to fall inward toward the center of the head and the lower extremity will be correspondingly projected outward. When
125 the wires are in their most erect position their lower extremities, which are bent outward, are sufficiently near the axis of the spindle B to clear in their revolution the radical face of the cam V, but when any
130 one of them assumes its natural inclined position, their lower extremities are sufficiently projected from the axis of the spindle to strike the radical face of the cam and thus turn the upright shaft L⁵ to which the latter is secured. The thread from each bobbin

is carried upward over the periphery of the head and passed around the upper extremity of its appropriate wire previous to its introduction through its corresponding eyelet *e* which is fixed near the periphery of the head. As long as the bobbin thread passes continuously from the bobbin to the rolls *F*, *F'*, the upper extremity of the wire will be drawn toward the eyelet and consequently its lower extremity will clear the cam *V*, but if the thread breaks or runs out, the upper extremity of the wire being released will fall inward, and the lower extremity being correspondingly projected outward will strike the cam *V* and thus turning the upright shaft *L*⁵ will pull the cord *o* sufficiently to raise the pawl *U* from the notch in the sliding bar *S*, which being thus freed will allow the weight *Q* acting through the upright lever *R* to throw the belt pulley *O* out of gear with the drum *K*, thus stopping the motion of all those portions of the machine which are driven by the drum shaft, and which effect the progressive doubling, twisting, and spooling.

The wires of the head may be variously modified, but such modifications do not affect the principle of my invention; thus in Fig. 5 the wires are bent in the form of a *V* and are inserted in slots made in the head; one of the forks of the *V* projects upward the other passes through the head and projects from its periphery on the side opposite to that at which the eyelet and upper fork of the *V* are situated; the wire is pivoted at its apex to the head. The bobbin thread is passed over the head, around the upper fork of the *V* and through the eyelet, thus drawing the upper fork toward the eyelet and raising the lower or projecting fork sufficiently to pass over the cam *V*; when the thread breaks this projecting extremity falls, and striking the radical face of the cam, effects the stoppage of the spinning apparatus in the same manner as the wires first described.

In the modification represented at Fig. 6 the wire is also *V* shaped, and the upper extremity of the upright fork is pivoted to the head. In Fig. 7 the wire is also *V* shaped but in this example the *V* is inverted, and the lower extremity of the upright arm is pivoted to the head. In Fig. 8, the wire is bent as represented in the drawing and

is pivoted to one of the faces of a prismatic head; the thread is first passed over a pin *w* projected from the face to which the wire is pivoted, then around the lower extremity of the wire *c* and lastly through an eyelet formed at its upper extremity. As long as the thread remains continuous the bent part of the upper portion of the wire is held sufficiently near the axis of the spindle to clear the cam *V*; but when the thread runs out or breaks this bent part falling outward by its weight strikes the cam and effects the stoppage of the spinning apparatus. I have not deemed it necessary to give more than a general description of the construction and operation of each of these modifications as the drawings in connection with the description of the head described as attached to my machine are sufficient to enable a person skilled in the art to put any one of them in operation, as well as to construct other modifications on the same principle.

In doubling and twisting some kinds of yarn or thread it may so happen that the friction of the yarns in unwinding from their bobbins and against the sides of the head may be insufficient to produce sufficient tension to cause the yarns to hold the upper extremities of the stopping wires in their proper positions; in such cases the resistance to the movement of the yarns may be increased by giving them one or more turns around a button or knob *x*, Fig. 5, projected from the side of the head.

Having thus described my improved machine for doubling, twisting, and spooling yarn what I claim therein as new and desire to secure by Letters Patent is—

The stop wires so constructed and connected with the head of the spindle and with the strands of the yarn that whenever any of the latter are broken or run out the stop-wires shall move and effect the disconnection of the machinery from the moving power, thereby stopping it substantially as herein set forth.

In testimony whereof I have hereto subscribed my name.

MOSES HEY.

Witnesses:

JOSEPH HEY,
P. H. WATSON.