





# UNITED STATES PATENT OFFICE.

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## BALL-WINDER.

No. 846,968.

Specification of Letters Patent.

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*To all whom it may concern:*

Be it known that I, FRED A. WHITMORE, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Ball-Winders, of which the following is a specification.

My invention relates to "ball-winders," so termed, which are used for winding yarn or sliver into a ball, ready for the comb; and my invention particularly relates to improvements in the stopping and locking mechanism for the rotary and longitudinally-movable spindle, on which the yarn or sliver is wound, in the class of machines referred to.

The object of my invention is to provide an improved construction of the stopping and locking mechanism for the spindle on which the yarn or sliver is wound.

My invention consists in certain novel features of construction of my improvements, as will be hereinafter fully described.

I have only shown in the drawing a detached portion of a ball-winder embodying my improvements, sufficient to enable those skilled in the art to understand the construction and operation of the same.

Referring to the drawing, Figure 1 is a front view of a ball-winder head embodying my improvements, with the spindle and disk and hand-wheel partially broken away. Fig. 2 corresponds to Fig. 1, but shows some of the parts in the opposite position. The complete hand-wheel is shown in this figure. Fig. 3 is a section on line 3-3, Fig. 1, looking in the direction of arrow *a*, same figure. The upper part of the hand-wheel (not shown in Fig. 1) is shown in this figure.

In the accompanying drawing, 1 is the ball-winder stand adapted to be mounted and fastened on a table or suitable support (not shown) by screws 1' and having thereon the spindle-bearing or head 2.

3 is a disk or plate loosely mounted on the head 2.

4 is the spindle having the tapering and square-shaped end 4', on which the yarn or sliver (not shown) is wound. The spindle 4 has a rotary and a longitudinally-reciprocating motion within the head 2 and has loosely mounted thereon and connected therewith a sleeve 5, having a rack or teeth 5' thereon, which are adapted to mesh with

the teeth on a pinion 6, which is fast on a rotary shaft 7, mounted in suitable bearings on the under side of the head 2. The shaft 7 has a rotary movement communicated thereto in one direction or the other by a hand-wheel 8, having in this instance two handles 8'.

All of the above-mentioned parts except the construction of the hand-wheel 8 may be of the usual and well-known construction in ball-winders of the class referred to.

I will now describe my improvements. On the shaft 7 is loosely mounted the hub 9' of a segment 9, which as it is moved around on the shaft 7 will come in contact with a stationary stud or stop 10, secured in the lower side of the head 2. On the shaft 7 is splined the hub 11' of an arm 11. The arm 11 at its outer end carries a stud 12, which is loosely mounted to have a rotary movement. On one end of said stud 12 is fast an arm or lever 13, which extends between two lugs or projections 8'' on the inner side of one of the spokes of the hand-wheel 8. On the other end of the stud 12 is fast a catch or pawl 14, which is adapted to engage a stud 15, in this instance adjustably secured in an elongated slot 2' in an extension 2'' on the head 2. A spring 16, in this instance a helically-coiled spring, is attached at one end to the arm 11, and at its other end is connected with the pawl or catch 14 and acts to raise said pawl or catch 14 to engage the stud 15 when said pawl or catch is not moved out of engaging position by the movement of the arm or lever 13. The segment 9 has a lug or projection 9'' thereon, which extends in the path of and is adapted to be engaged by the arm 11 as said arm is rotated with the shaft 7. The hand-wheel 8 has its hub loosely mounted on an extension of the hub 11' of the arm 11. (See Fig. 3.)

The operation of my improvements will be readily understood by those skilled in the art. Supposing the parts of the machine to be in the position shown in Fig. 1, with a full ball of yarn or sliver (not shown) on the end 4' of the spindle 4 ready to be doffed or removed, the hand-wheel 8 through one or both of the handles 8' is turned to the left in the direction indicated by arrow *b*, Fig. 1, and the engagement of the lug 8'' at the right, Fig. 1, on a spoke of the hand-wheel with the arm or lever 13 will move said arm or lever to



the left, Fig. 1, and through the rocking of said stud 12 disengage the catch or pawl 14 from the stud 15, against the action of the spring 16 and release the arm 11, fast on the shaft 7, and allow the rotation of said shaft and the pinion 6, fast thereon, and cause the movement, through the rack-teeth 5', of the sleeve 5 and the spindle 4, attached thereto, to move the spindle within the head 2, as shown in Fig. 2. There is in this instance nearly one revolution of the hand-wheel 8 and the arm 11 and shaft 7 before the arm 11 engages the lug 9'' on the segment 9, loose on the shaft 7, and nearly one-half revolution of the hand-wheel 8 before the segment 9 moves from the position shown in Fig. 1 to the position shown in Fig. 2 and into engagement with the stud or stop 10, which stops any further movement of the segment 9 and through the engagement of the arm 11 with the lug or projection 9'' stops any further movement of the arm 11, the hand-wheel 8, and the shaft 7. The movement of the hand-wheel 8 to withdraw the spindle 4 to doff or remove the ball of yarn or sliver is in this instance about one and one-half turns. To move the spindle 4 in the opposite direction and out of the head 2 preparatory to the winding of another ball thereon, the hand-wheel 8 is moved in the opposite direction or in the direction indicated by arrow *c*, Fig. 2. Nearly one revolution of the hand-wheel 8 will be made, and then the arm 11 will engage the projection 9'' on the segment 9 in the opposite direction from that shown in Fig. 2 and move said segment around until it engages the stop or stud 10, as shown in Fig. 1. The engagement of the segment 9 with the stud 10, as shown in Fig. 1, stops the rotary movement of the arm 11, hand-wheel 8, and shaft 7, and at the same time the spring 16 acts to raise the pawl or catch 14 to engage the stud 15 and lock the hand-wheel 8, arm 11, and shaft 7 in position.

The advantages of my improvements will be readily appreciated by those skilled in the art. The hand-wheel and other parts are thus automatically locked in position when the spindle is in its inward position, as shown in Fig. 1, and the ball of yarn or sliver is be-

ing wound thereon. The movement of the hand-wheel in one direction to doff the ball of pile-warp or remove it from the spindle will cause the unlocking of the hand-wheel and other parts and allow the longitudinal movement of the spindle to a predetermined distance. The movement of the hand-wheel in the opposite direction will move the spindle in the opposite direction to a predetermined distance and lock the spindle and other parts of the mechanism in this position preparatory to winding on the spindle a ball of yarn or sliver.

It will be understood that the details of construction of my improvements may be varied, if desired. I have shown and described a hand-wheel; but it will be understood that, instead of a wheel, a hand-lever or crank-arm or other suitable device may be used.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a ball-winder for yarn, &c., the combination with a hand-wheel for moving longitudinally, through intermediate mechanism, the spindle on which the yarn is wound, of a positive stop for the hand-wheel on the outward and inward movement of the spindle, and locking mechanism for automatically locking and holding the spindle in its inward position.

2. In a ball-winder for yarn, &c., the combination with the spindle on which the yarn is wound, a rack connected with said spindle, a pinion for moving said rack, a rotary shaft carrying said pinion, and a hand-wheel for rotating said shaft, of connections intermediate said hand-wheel and shaft, and means for positively stopping the rotation of said hand-wheel and said rotary shaft in each direction, at the end of each longitudinal movement of said spindle, and means, automatically operated, for holding and locking the rotary shaft when the spindle is in its inward position.

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Witnesses:

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