(No Model.)

C. E. BEAN.

BOBBIN BUILDER FOR YARN WINDING MACHINES, &c.

No. 262,349. Patented Aug. 8, 1882.

Fig 1.

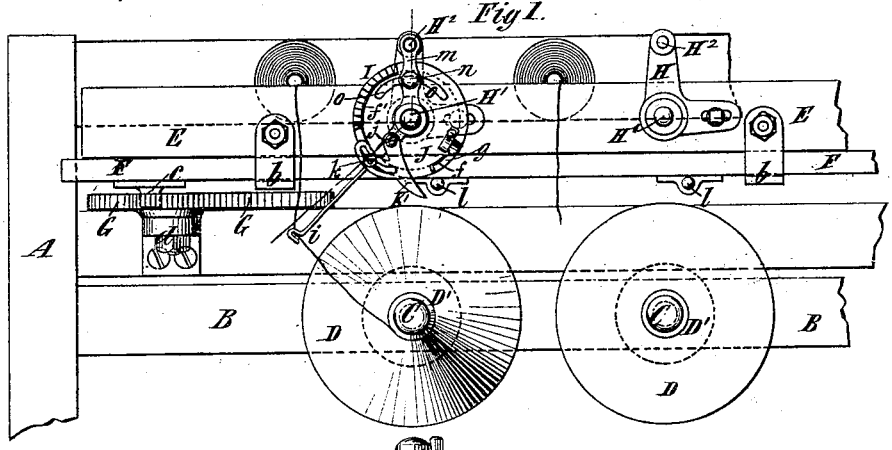


Fig 2.

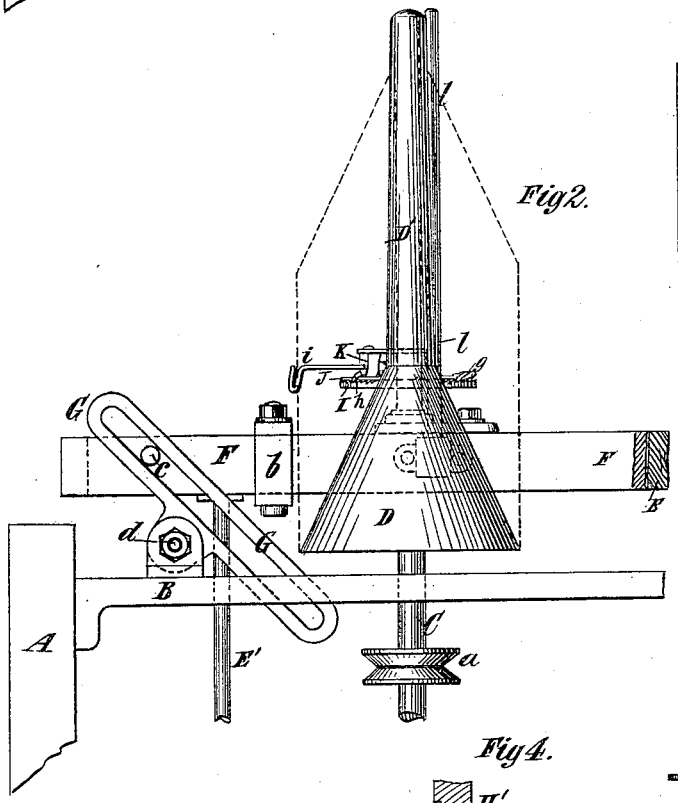


Fig 3.

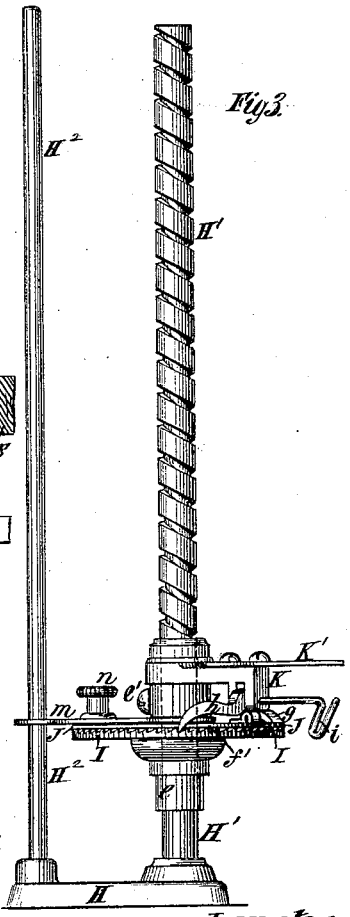
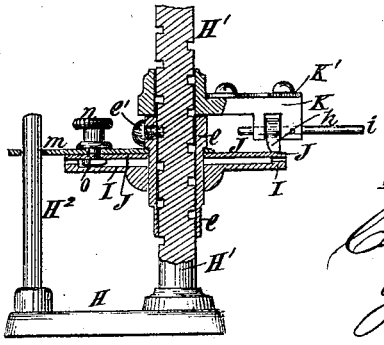


Fig 4.



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UNITED STATES PATENT OFFICE.

CHARLES E. BEAN, OF FALL RIVER, MASSACHUSETTS, ASSIGNOR OF TWO-THIRDS TO SETH H. WETHERBEE AND MATTHEW C. YARWOOD, BOTH OF SAME PLACE.

BOBBIN-BUILDER FOR YARN-WINDING MACHINES, &c.

SPECIFICATION forming part of Letters Patent No. 262,349, dated August 8, 1882.

Application filed March 28, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BEAN, of Fall River, in the county of Bristol and State of Massachusetts, have invented certain new and useful Improvements in Bobbin-Builders for Yarn-Winding Machines, &c., of which the following is a specification.

In hosiery-winders and spooling-machines the bobbins or spools commonly have a cone-shaped base and a central extension of uniform diameter above the cone, and the thread or yarn is wound in conical layers.

In winding bobbins or spools of this class the thread or yarn guide or carriers have been carried by screw-threaded standards on a rising and falling rail; and the object of my invention is to provide a very effective and accurately-working means for giving the necessary progressive upward movement to the thread or yarn guides or carriers at each falling movement of the guide-rail, so that as the bobbins or spools are built up the thread or yarn guides or carriers will be maintained in proper position to guide the thread or yarn into the conical layers as they are superposed one above the other, and also to provide for conveniently regulating the progressive upward movement of the guides or carriers to suit different-sized thread or yarn.

To this end my invention consists in the combination, in a winding or spooling machine with a rising and falling rail and screw-threaded standards thereon, of ratchet-wheels upon and gearing with said screw-threaded standards, arms loosely fitting said standards and carrying the yarn guides, and pawls engaging with the ratchet-wheels, and means for actuating said arms, as hereinafter described, to cause their pawls to advance the ratchet-wheels for raising them, together with said arms and yarn-guides, upon the standard, the return movements of the said arms and pawls being effected by the yarn which is deflected by the yarn-guides in the active movements of the pawls.

The invention also consists in the combination, with the aforesaid rising and falling guide-rail, screw-threaded standards, ratchet-wheels, and swinging arms, each carrying a yarn-guide and pawl, of a bar carried by the rising and falling guide-rail and adapted to engage with the swinging arms to actuate them, and a cam for reciprocating said bar as it rises and falls with the guide-rail to cause it to act on the swinging arms. In this combination the cam may be made adjustable, so that the length of longitudinal movement imparted to the aforesaid bar may be varied, and the swinging arms may be provided each with an adjustable extension or auxiliary arm, which may be secured in different positions on the swinging arm to vary the amount of movement given said arm by the reciprocating bar.

The invention also consists in the combination of a screw-threaded standard, a ratchet-wheel screwed thereon, a swinging arm loosely fitting the standard and carrying a pawl for actuating the ratchet-wheel and also carrying a yarn-guide, mechanism for moving the swinging arm positively in one direction, and shields which cover and protect the principal portion of the ratchet-wheels, and over which the actuating-pawls ride in their return movements, such shields being adjustable, so that by them the pawls will be held out of contact with the ratchet-wheels during a greater or lesser part of their forward movements, as hereinafter fully described.

The invention also consists in a novel combination of parts hereinafter described.

In the accompanying drawings, Figure 1 represents a plan of a portion of a machine embodying my invention. Fig. 2 represents a side elevation thereof. Fig. 3 represents a side elevation, upon a larger scale, of the parts which operate the yarn-guide, and Fig. 4 represents a vertical section of the parts represented in Fig. 3, upon the same scale.

Similar letters of reference designate corresponding parts in all the figures.

A designates a portion of the side frame of the machine, and B designates the spindle-rail, wherein are supported any suitable number of spindles C, of which *a* designates the whirl.

D designates the conical base portion of the bobbin or spool, and D′ the upward extension thereof.

E designates the guide-rail, which is supported upon rods E′, and through these rods the rail has a rising-and-falling motion communicated to it by any suitable mechanism, such as is usually employed for the purpose, and which is not here represented.

F designates a bar, which is connected with the rail E by guides or brackets *b*, so that it must rise and fall therewith, but so that it can be moved longitudinally or in a horizontal direction relatively to the rail E.

G designates a stationary slotted cam, which receives a pin or roller, *c*, on the bar F, as clearly seen in Fig. 2, and which is fulcrumed by the pin or bolt *d* on the spindle-rail B, so that by loosening the pin or bolt *d* the cam G may be adjusted to any desired inclination, after which the bolt may be tightened to secure the cam in place.

From the above description it will be clearly understood that as the rail E and bar F rise the latter is moved toward the left, and in the opposite direction as the rail falls. In lieu of the cam G, other devices may be employed for reciprocating the bar F.

Upon the rail E are mounted base-pieces H, one for each spindle C, and each carrying a screw-threaded standard or upright, H′, and a guide-rod, H², parallel with said standard or upright.

Upon the standard or upright H′ is a sleeve, *e*, which has a set-screw, *e′*, engaging with the screw-thread of the standard, as clearly seen in Fig. 4, and this sleeve may therefore be considered as a nut, as it might be otherwise formed to engage with the screw-threaded standard.

Upon the sleeve *e* is secured the ratchet-wheel I, and as the sleeve might be made in one piece with the wheel it may be considered simply as the hub thereof.

Above the ratchet-wheel I is represented a disk, J, which it fitted loosely on the sleeve *e*, and constitutes a shield or protecter to cover the teeth of the wheel I. The shield J covers the teeth of the wheel I at all points save at *ff′*, where it leaves them exposed, and in the opening *f* is a stop-pawl, *g*, which engages with the teeth of the wheel I and keeps it from turning backward or downward, the said pawl being carried by the shield J, as clearly shown in Fig. 1.

K designates an arm loosely fitting on the standard H′, above the sleeve *e*, so that it may turn freely thereon, and said arm carries an actuating-pawl, *h*, for rotating the ratchet-wheel I to raise it on the standard H′, and also carries the yarn-guide *i*, as best shown in Fig. 3.

K′ designates an auxiliary arm, which is pivoted to the arm K at *j*, and is also secured to said arm K by a clamping-screw, *k*, engaging with a slot in the arm K′, as clearly shown in Fig. 1, and by this means I provide for swinging or adjusting the auxiliary arm K′ on its pivot, and then securing it in any desired position. The arm K′ may be considered as an extension of or part of the arm K.

Upon the reciprocating bar F, adjacent to each spindle C, is an upwardly-projecting finger or arm, *l*, which may be considered as part of the bar. As the rail E and bar F rise the latter is carried by the cam G toward the left, and this movement causes the finger or arm *l* on said bar to act upon the arm K′, and thereby swing the arm K K′ in the direction required to cause the actuating-pawl *h* to engage with the teeth of the wheel I to raise the latter on the standard H′. This movement of the arm K′ produces a corresponding movement of the yarn guide or carrier *i*, and thereby deflects the yarn out of its usual course, and as soon as the bar F moves toward the right during the downward movement of the rail E the finger or arm *l* leaves the arm K′, and as fast as it recedes the tension of the yarn draws back the arms K K′, and thus makes the return movement of the pawl *h*. This construction and arrangement are very desirable, because if the yarn breaks the arm K′ and pawl *h* will not be moved back, and hence they can receive no further motion from the finger or arm *l* until the yarn is connected, no matter how many times the rail E and bar F rise and fall. It will be observed that the stroke of all the pawls *h* on the machine may be increased or diminished by altering the inclination of the cam G. As the pawl *h* makes its return movement it rides upon the shield J, and during the first part of its forward or active movement it is prevented from engaging with the teeth of the wheel, as a greater or lesser portion of its movement is completed before it reaches the opening *f′* in the said shield. Consequently it will be seen that to increase the active stroke of the pawl *h*, as is necessary in winding coarse yarn, all that is required is to shift the shield J so that the pawl will drop into the teeth of the wheel I earlier in its stroke, while to adjust the apparatus for winding fine yarn the shield must be adjusted so as to hold the pawl out of engagement with said wheel during a greater part of the stroke.

To secure the shield in different positions, I employ an arm, *m*, which is fitted over the guide-rod H² and the sleeve *e* so that it cannot be turned, and in said arm is a clamping-screw, *n*, which engages with an arc-shaped slot, *o*, in the shield, as shown clearly in Fig. 1. By loosening the screw the shield may be shifted, after which the screw is tightened to hold the shield in place.

By my invention I provide a very simple and accurate means for adjusting the thread or yarn guide or carrier, and I regulate the movements thereof so as to suit the size of thread or yarn wound on each bobbin, be it fine or coarse.

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

1. The combination, with a rising and falling guide-rail and screw-threaded standards thereon, of ratchet-wheels upon and engaging with the screw-threads of said standards, swinging arms loosely fitting said standards,

and each provided with a yarn-guide and a pawl for engaging with its ratchet-wheel, and means for swinging said arms to cause the pawls carried thereby to actuate said ratchet-wheels, substantially as and for the purpose specified.

2. The combination, with a rising and falling guide-rail and screw-threaded standards thereon, of ratchet-wheels upon and gearing with the screw-threads of said standards, swinging arms loosely fitting said standards, and each provided with a yarn-guide and a pawl for actuating its ratchet-wheel, a bar carried by said rising and falling rail, and adapted to engage with the swinging arms to actuate them and a cam for reciprocating said bar as it rises and falls, substantially as and for the purpose specified.

3. The combination, with the rising and falling rail E and bar F, of the cam G, adapted to be adjusted to vary the length of movement of the bar F, the screw-threaded standard H′, ratchet-wheel I, arms K K′, and finger *l*, the pawl *h*, and yarn-guide *i*, substantially as specified.

4. The combination of the screw-threaded standard, a ratchet-wheel screwed thereon, a swinging arm loosely fitting the standard and carrying a pawl for actuating the ratchet-wheel, and also carrying a yarn-guide, mechanism for moving the swinging arm positively in one direction, and an adjustable shield having an opening through which said pawl may drop into engagement with the ratchet-wheel and adapted to be turned to keep said pawl out of engagement with the wheel through any desired portion of its movement, substantially as and for the purpose specified.

5. The combination of the screw-threaded standard H′, the guide-rod H², the ratchet-wheel I, screw-threaded and engaging with said standard, the arm K, carrying the pawl *h* and yarn-guide *i*, the rotary shield J, provided with an opening, *f′*, and an arc-shaped slot *o*, and the arm *m* and clamping-screw *n*, all substantially as herein specified.

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