

J. SCHOFIELD.
BOBBIN-WINDER.

No. 177,162.

Patented May 9, 1876.

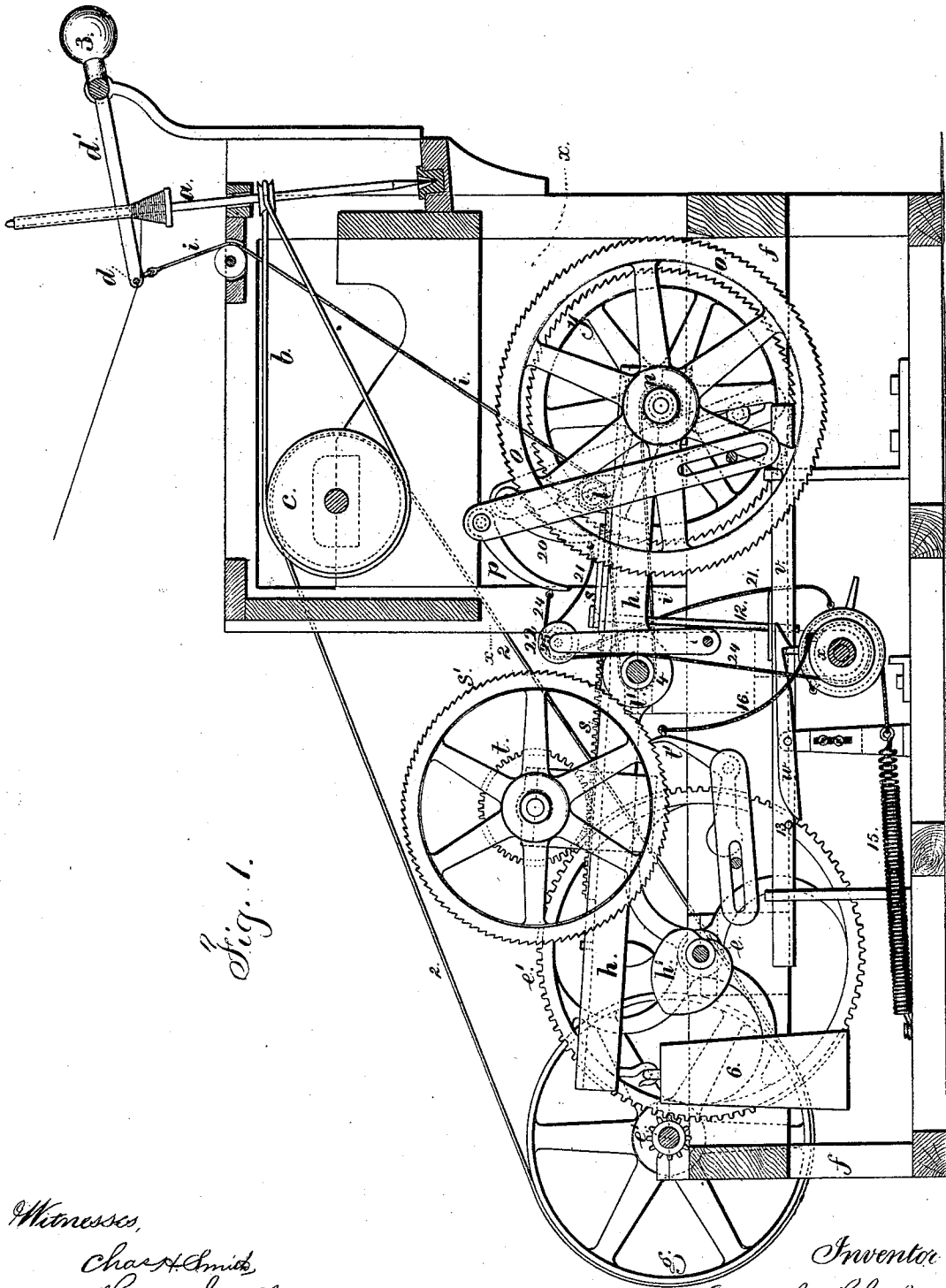


Fig. 1.

Witnesses,

Chas. H. Smith
Harold Snell

Inventor

Joseph Schofield
per L. N. Perrell
att'y

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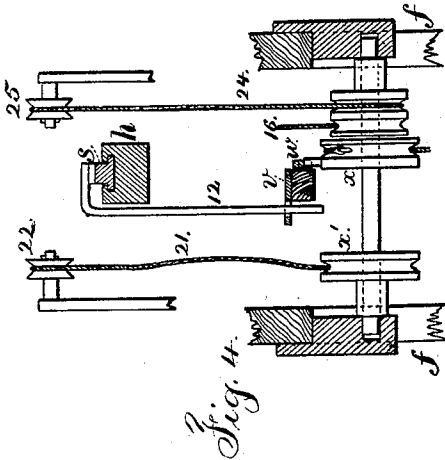


Fig. 4.

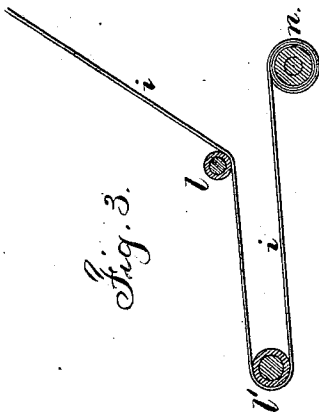
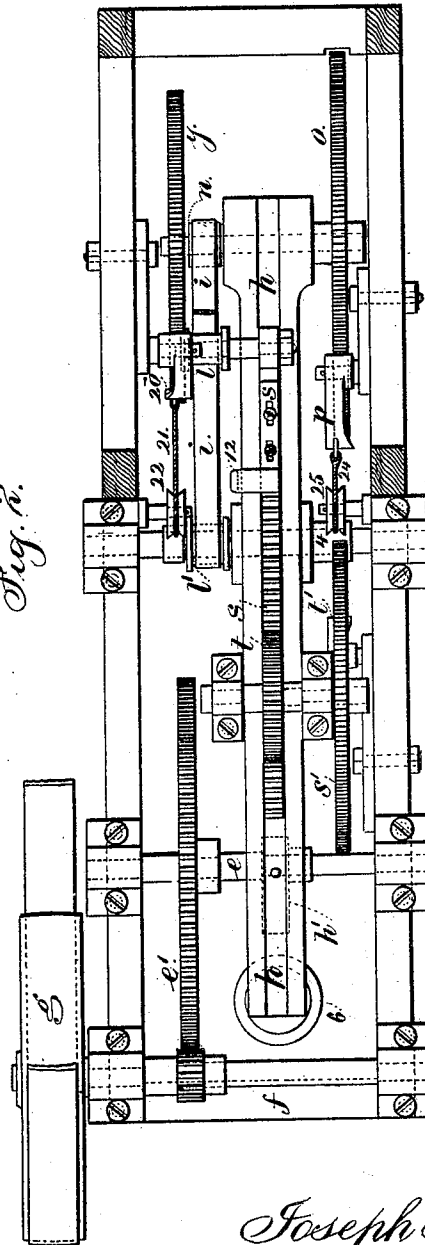


Fig. 3.

Fig. 2.



Witnesses

Chas. H. Smith
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UNITED STATES PATENT OFFICE.

JOSEPH SCHOFIELD, OF WEST PITTSFIELD, MASSACHUSETTS.

IMPROVEMENT IN BOBBIN-WINDERS.

Specification forming part of Letters Patent No. **177,162**, dated May 9, 1876; application filed June 28, 1875.

To all whom it may concern:

Be it known that I, JOSEPH SCHOFIELD, of West Pittsfield, in the county of Berkshire and State of Massachusetts, have invented an Improvement in Bobbin-Winders, of which the following is a specification:

In winding thread upon bobbins, the convolutions have been in the form of cones, the base of each conical layer of thread being the diameter of the bobbins as filled with thread. To wind the bobbin with uniformity in this manner it has been usual to employ a wooden bobbin or quill that has had a tapering base that corresponds to the conical form in which the thread is wound. In making use of this character of bobbin or quill there is considerable loss in the space that can be filled with thread, and the bobbin is unnecessarily heavy. In my improved winder I am enabled to make use of a bobbin or quill that is tubular and provided with a head at one end, instead of a conical base, and I provide mechanism that winds the thread into the angle between the tube and head of the quill in a conical form, and when this has been accomplished the remainder of the bobbin is wound in conical layers. This improved mechanism is available for winding threads or yarn of any character, and may be used upon a spinning-jack or in a winder of any character.

In the drawing, Figure 1 is an elevation of the mechanism employed by me with the frame-work partially removed. Fig. 2 is a plan of the same below the line *xx*. Fig. 3 is a diagram, showing the let-off rollers and band; and Fig. 4 is a cross-section of the rocker.

The spindles *a* are driven by the bands *b* from the drum *c*, as usual, and the follower or thread-guide *d* is a wire upon the arms *d'*, that are raised by the weight 3, as usual. My improved apparatus is applied either at one end of the winding-frame or near the middle, according to the number of bobbins, and the parts are sustained by a suitable frame, *f*. The actuating-shaft *e* is driven by a connection to the drum *c* or otherwise. I have shown the belt 2, pulley *g*, and gearing *e'* for the purpose of rotating this shaft *e*. Above this shaft *e* is the rocker-lever *h*, that is set to swing upon the cross shaft or fulcrum 4, and this rocker is oscillated by the heart-cam *h'* on

the shaft *e*, and a weight or spring, 6, is employed to keep the rocker in contact with the cam. The let-off band *i* passes from one of the thread-guide arms, *d'*, beneath a regulator-roller, *l*, around the roller *l'* to the roller *n*, to which it is attached so as to be wound thereon before the commencement of each winding operation and unwound as the bobbins are filled, so as to allow the thread-guide to rise and act nearer the top of the bobbins. Upon the shaft of the roller *n* there is a ratchet-wheel, *o*, and a stationary pawl, *p*, contiguous thereto. It will be now apparent that if this rocker is used with a bobbin or quill having a conical bottom the thread will be wound upon the entire bobbin progressively, as a series of conical layers, because the rocking-lever will let up the thread-guide and draw it down alternately a regular distance, and the let-off band will be gradually and slowly unwound by the ratchet-wheel *o* moving up against the stationary pawl *p*.

I now proceed to describe the peculiar movement by which I am enabled to wind the thread in a gradually-enlarging conical form to fill the angle between the tubular quill and end of the bobbin.

The regulator-roller *l* is upon the slide *s*, that is moved in a groove in the rocker-lever *h* by the pinion *t* acting upon teeth upon the slide *s*; hence, when the pinion *t* is turned so that the roller *l* is drawn back near the fulcrum 4 of the rocker *h*, the arc described by this roller is small and the consequent rise and fall of the thread-guide is small, and the extent of movement of the thread guide will be increased as the rack is moved along to move the roller *l* farther from the fulcrum 4. This is accomplished by the ratchet-wheel *s'* on the shaft of the pinion *t* moving against the stationary pawl *t'* as the rocking-lever is swung. The parts are proportioned so that the rack will move along the required distance while the winding process is building up the cone of thread at the base of the bobbin, and after this cone of thread is wound, then the movement last described must cease, so that the slide *s* will not receive any further end movement during the winding of the conical layers, as first described. I throw the pawl *t'* out of action when the endwise move-

ment of the slide has been completed so as to allow the ratchet-wheel *s'* to remain unacted upon. This is accomplished by a sliding shifting-bar, *v*, that is moved along with the rack-bar *s* by an arm, 12, extending downwardly from it and passing into a slot in the shifting-bar *v*, and this bar *v* has a pin upon it at 13, to trip the latch *w* at the proper point and allow the barrel *x* to be partially revolved by a cord and spring, 15, and this barrel in its movement draws upon the cord 16 of the pawl *t'* and throws it out of action. When the winder is winding the cone of thread at the base of the bobbin the let-off roller *n* upon the rocker is turned progressively, but faster than when the complete conical layers of thread are being wound. To effect this object I use a second ratchet-wheel, *y*, upon the shaft of the let-off roller *n*, and this ratchet-wheel is smaller than the ratchet-wheel *o*, hence it is revolved by fewer oscillations of the rocker. The pawl 20 of this wheel *y* is connected by a cord, 21, over the pulley 22, with the second barrel *x'*, and the pawl *p* of the wheel *o* is also connected with the barrel *x* by a string or cord, 24, over the pulley 25, but these cords pass to opposite sides of the barrel *x*, so that when the said barrel is turned by the spring 15, the pawl 20 is withdrawn and the pawl *p* allowed to fall into action. At the same time the pawl *t'* is withdrawn out of action, as aforesaid. When the winding operation has been completed, the rack-slide *s* is moved back by hand or otherwise to a predetermined point, and then the barrels *x x'* are turned back and caught by the latch *w*, which releases the pawls *t'* and 20, so that they are ready for operation, and the

pawl *p* drawn back out of action, and the winder is ready for operation after the full bobbins have been removed and empty ones placed upon the spindles.

I am aware that in a spinning-machine mechanism has been provided for winding the bobbin or quill with a conical base, but the same is complicated and expensive, and is not adapted to being applied to machines already built. My improvement is simple, easily constructed, and adapted to being applied to bobbin-winders, and is very different in its construction from the spinning-machines heretofore made.

I claim as my invention—

1. The rocking-lever *h*, fulcrumed to a stationary frame and the revolving cam *h'*, in combination with the let-off roller *n*, band *i*, ratchet-wheel *o*, pawl *p*, and thread-guide *d*, substantially as set forth.

2. The regulator-roller *l*, rack *s*, pinion *t*, and ratchet-wheel *s'*, in combination with the rocker-lever *h*, fulcrumed to a stationary frame, let-off roller *n*, band *i*, and winding mechanism, substantially as set forth.

3. The shifting-bar *v*, and operative mechanism, latch *w*, drums *x x'*, pawls *t p* 20, and their connections, in combination with the rocker *h*, ratchet-wheels *s' o y*, let-off roller *n*, rack *s*, and regulator-roller *l*, substantially as specified.

Signed by me this 12th day of June, 1875.

JOSEPH SCHOFIELD.

Witnesses:

WILLIAM T. FELLEYS,
HENRY C. EDWARDS.