W. ATKINSON.

Bobbin Winding Machines.

No. 142,188. Patented August 26, 1873.

FIG. 1.

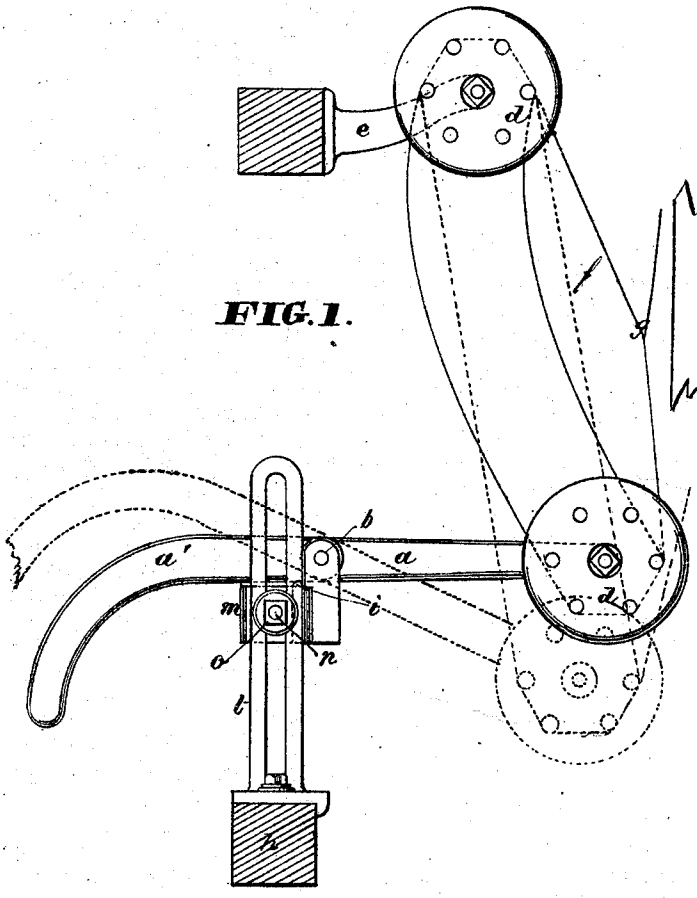


FIG. 2.

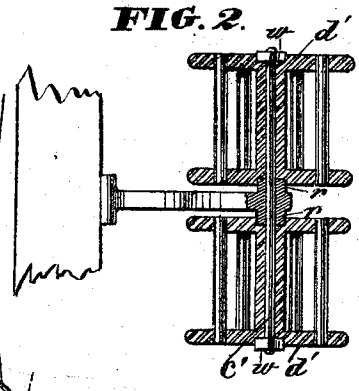


FIG. 4.

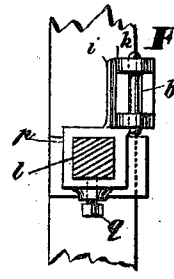


FIG. 3.

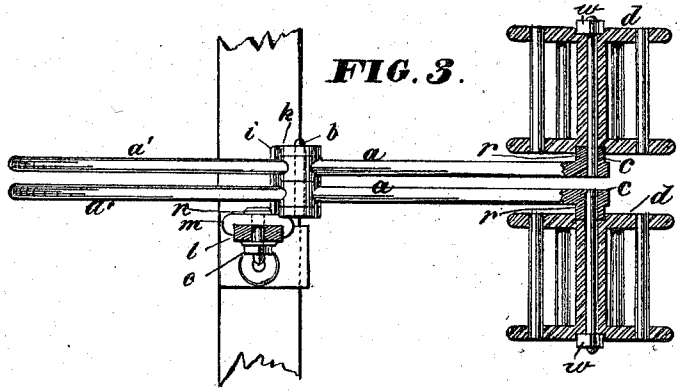
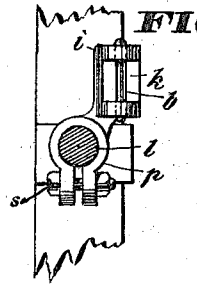


FIG. 5.



WITNESSES.

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UNITED STATES PATENT OFFICE

WILLIAM ATKINSON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THOMAS WOOD, OF SAME PLACE.

IMPROVEMENT IN BOBBIN-WINDING MACHINES.

Specification forming part of Letters Patent No. **142,188**, dated August 26, 1873; application filed February 17, 1873.

To all whom it may concern:

Be it known that I, WILLIAM ATKINSON, of Philadelphia, in the State of Pennsylvania, have invented certain Improvements in Bobbin-Winding Machines, of which the following is a specification:

Heretofore the usual custom with manufacturers of textile fabrics has been to wind the filling-yarn from the hank or skein on the spool, and from the spool onto the shuttle-bobbin. Attempts to wind directly from the hank onto the bobbin have been repeatedly abandoned on account of the frequent breakage caused by the entanglement of the yarn and the varying speed with which the yarn passed from the hank to the bobbin—the result of winding the yarn on the frustum of a cone running at a uniform angular velocity. It was found that, by giving the hank a sharp jerking pull whenever an entanglement occurred, the unwinding thread was released without breakage. In order to imitate automatically this jerking action in the event of the entanglement of the yarn, the expedient has been tried of stretching the yarn for winding upon a pair of swifts or barrels arranged one above the other, and mounting the axis of the lower one on the end of a horizontal lever, which will be drawn up in the event of an obstruction to the running off of the yarn. This does not prove effective in releasing the entanged yarn; but I have discovered that the jerk produced by the sudden arrest of the descent of a weight will accomplish the desired effect. My invention consists in combining, with the lever above referred to, a counter-arm, bent in such a manner that it will exert the greatest effect as a counter-balance when the lever is in its lowest position, and a stop to suddenly arrest the descent of the counter-arm when the lever rises, as hereinafter described.

In the accompanying drawing, Figure 1 is a side elevation of my improved apparatus. Fig. 2 is a horizontal section of the upper pair of barrels. Fig. 3 is a horizontal section of the lower pair of rollers, showing a plan view of the supporting-levers. Figs. 4 and 5 represent plans of the adjustable fulcrum-bearings under modified forms, with the levers removed.

a a represent levers, supported on a common fulcrum, *b*, and carrying at their ends pins *c c*, on which the swifts or barrels *d d* revolve. *d' d'* are barrels revolving on a pin, *c'*, fixed above in a stand, *e*. The line *f* indicates the hank of yarn stretched between the barrels *d d'*, and *g* the thread passing to the bobbin. *a'* is a counter-arm, extending backward from the lever *a*, and curved downward toward the extremity, as represented, so that it will exert its greatest influence when the arm *a* is below a horizontal position. *i* is a stop on the bearing *k*, to the rear of the fulcrum *b*, adapted to arrest suddenly the descent of the counter-arm *a'* as the forward arm *a* is drawn up. To provide for the vertical adjustments of the fulcrum of the levers, the fulcrum-pin *b* is mounted on a bearing, *k*, which may be moved up and down on the vertical standard *l*, and fixed in any desired position. Various expedients may be employed for shifting and securing this bearing. In Figs. 1 and 3 I have shown the standards *l* slotted, and the bearing *k* formed with a jaw, *m*, partially embracing the said standard, and clamped thereto by means of a bolt, *n*, and nut *o*. In Fig. 4 the bearing is attached to a band, *p*, fitting around a square standard, *l*, and fixed at any height by a set-screw, *q*. In Fig. 5 the standard *l* is represented as round, and the band *p* is clamped around it by a screw-bolt, *s*. The standard may, if preferred, be made with a dovetailed slot to receive and hold the bearing by the aid of a set-screw, or various other mechanically equivalent expedients may be employed. The device for preventing the yarn from winding on the pins upon which the barrels revolve, in case the hank runs off the barrel, consists in a countersink or recess in the ends of the barrels and bosses *r r* on the ends of the levers *a* and stand *e*, which occupy the recesses at the adjacent ends of the barrels *d d* and *d' d'*, while the nuts *w w*, which retain the barrels upon the pins *c* and *c'*, are received by the recesses at the outer ends.

It will be apparent that, when the yarn is running freely from the hanks, the levers *a a* rest in as low a position as the hank will allow, keeping the latter moderately stretched.

As soon, however, as any entanglement occurs, the end of that particular lever will be drawn up until suddenly arrested by the contact of the counter-arm a' with the stop i. This results in a jerking pull to the yarn, which releases the tangle, the effect being assisted by the greater resistance which the hank encounters, owing to the constantly decreasing effectiveness of the counter-arm a' while the arm or lever a ascends.

It will be understood that the curvature of the counter-arm a' places its center of gravity at a lower level, so that its center of gravity may be made to approach the vertical plane of the fulcrum by an elevation of the reel.

The curved balance-arm exerts its greatest influence while the swift or barrel is at its lowest position. If, now, the yarn becomes entangled, the lever-arm on which the reel hangs is lifted and the curved arm is depressed, and thus exerts a gradually decreasing counterbalancing effect upon the other arm, so that, in moving upward, a greater weight bears upon the lower end of the hank, and a greater tension is brought upon the unwinding thread, which will in many cases disengage it from surrounding threads; but if it does not do it, then the stop comes into action, and the thread must then either break or become disentangled. The object is to throw a gradually increasing tension upon the unwinding thread when it becomes entangled, in order to disentangle it thereby, if possible; if not, to stop it suddenly, and by the jerk disengage it.

Practical experiments have shown that in making the counterbalancing-arm straight and applying a weight thereto the decrease in counterbalancing effect is too sudden; the tension of the unwinding thread is increased too suddenly, and it will break. The counterbalancing weight must be distributed in a curve in order to act rightly.

The adjustability of the fulcrum-bearing does away with the necessity of changing the whole rail h to suit the length of the hanks, and when the hanks happen to be of unequal length I am enabled at least to adjust the height of the fulcrum for each two hanks.

The following is claimed as new:

1. The lever a, formed with a curved counter-arm, a', in combination with the fulcrum-pin b and stop i, substantially as and for the purposes set forth.

2. The combination and arrangement of the rail h, standards l e, bearing k, pin b, lever a, bent counter-arm a', barrels d d, and pins c c', substantially as and for the purposes explained.

WM. ATKINSON.

Witnesses:

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