

J. & T. A. BOYD.  
Machine for Winding Yarn.

No. 217,769.

FIG. 1 Patented July 22, 1879.

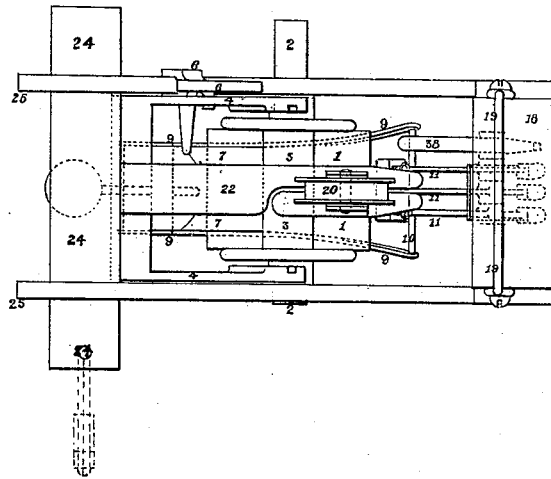
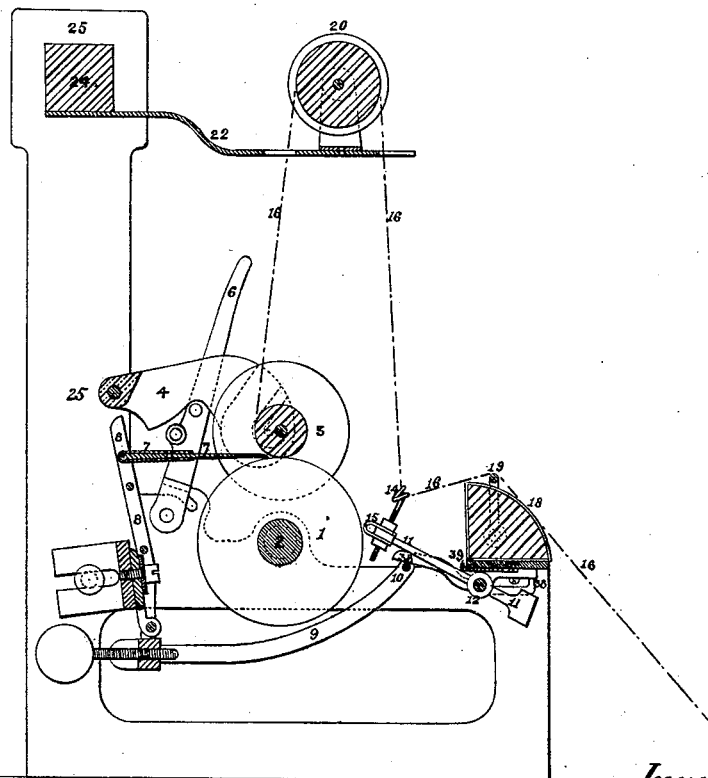


FIG. 2.



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# UNITED STATES PATENT OFFICE.

JOHN BOYD AND THOMAS A. BOYD, OF GLASGOW, SCOTLAND.

## IMPROVEMENT IN MACHINES FOR WINDING YARN.

Specification forming part of Letters Patent No. **217,769**, dated July 22, 1879; application filed April 29, 1878; patented in England, February 27, 1877.

*To all whom it may concern:*

Be it known that we, JOHN BOYD and THOMAS ALEXANDER BOYD, of Glasgow, in the county of Lanark, Scotland, have invented certain Improvements in Machines for Doubling and Winding Yarn or Thread, of which the following is a specification.

The object of our invention is to render extremely sensitive and certain the action of detector and stopping apparatus of doubling and winding machinery in which the rotation of the bobbin is stopped by the introduction of a slip of mill-board, metal, or other suitable material between the bobbin and the frictional driving-drum. For this purpose we arrange certain small detector-levers, of which there is one to each yarn or thread end of a set, with the hooks or curls at their inner ends, and we fix pieces of rubber or the like on their inner ends, so that when any lever drops its inner end touches the driving-drum, and its downward motion is thereby hastened and inforced and it acts more rapidly and forcibly on the slip-lever.

Our invention also consists in combining, with the pivoted slip-lever and detector-levers, a weighted lever to bear down on the slip-lever, so as to prevent its interfering with the fall of any of the detector-levers.

In the accompanying drawings, Figures 1 and 2 are, respectively, a plan and a vertical section, showing one doubling winding bobbin and the parts connected therewith.

The winding-drum 1 is, as usual, fixed on a longitudinal shaft, 2, and the bobbin 3, while resting on the top of the drum during the winding operation, is held in holders 4, jointed to bracket-pieces or standards 25, and having a hand-lever, 6, arranged in connection with them. The automatic stoppage takes place by the entrance of a slip or plate, 7, in between the drum 1 and bobbin 3, each slip being carried by a pair of arms, 8, forming part of the slip-lever of the detector details, and rising up from the center of that lever-piece behind the drum 1. This slip-lever is made with a pair of curved arms, 9, extending forward under the drum 1, and having a horizontal wire, 10, fixed across their front ends, and

the wire 10 is just below the inner parts of the detector-levers 11. The detector-levers 11, of which there is one for each end, are centered on a wire held in little brackets 12, fixed to the under side of a longitudinal rail, 13, and each lever 11 has a wire eye, 14, fixed to its inner end, where there is also fixed a piece, 15, of rubber or other suitable frictional material.

When the yarns 16 are drawn off cops, they are passed, as usual, over a curved bed, 18, covered with flannel, rubber, or other suitable material. We employ a separate frictional bed, 18, for each set of ends, and each bed is fitted with a small guide-rail, 19, which, being held by pinching-screws, can be easily adjusted to vary the extent of contact of the ends with the frictional surface. The yarn ends 16 pass over the frictional bed 18 and rail 19 to the eyes 14 of the detector-levers 11. From the detector-levers 11 the ends 16 pass up to and around a traverse roller or pulley, 20, all the ends to be wound on one bobbin going round the same traverse-pulley 20, and descending from the inner side thereof to the inner side of the bobbin 3. Each traverse-pulley 20 may be covered with rubber to prevent slack or loose ends from springing forward. The traverse-pulley 20 is fixed by a bracket, 22, to a longitudinal traverse-bar, 24, made, by preference, of wood, and serving for both sides of the machine. This traverse-bar 24 is guided in standards 25, formed or fixed centrally on the end frames of the machine, and in some cases, also, on intermediate transverse frames, and the bar has the traverse motion imparted to it by chains connected with the usual traverse-motion cam.

We prefer to arrange the traverse-bar at some distance from the bobbin, as shown in the drawings, in order that the yarn or thread ends may move through a lengthened course between the detector-levers and the bobbin, so that when an end breaks the machine will always be stopped before the broken end can reach the bobbin.

The several ends of a set go together upon the elevated traverse-bar pulley, which is of such a size as to have some frictional hold on

the ends, and, in consequence of this, if the ends are of unequal strength the weaker will be assisted by the stronger.

The yarn or thread end 16 is shown entire in Fig. 2, and the parts are all in the positions they have when the winding is proceeding properly. Each end 16 when unbroken holds up its detector-lever 11, which is nicely balanced for that purpose; but on the end breaking or failing the lever 11 falls, and its descent is hastened by the drum 1, in consequence of the rubber 15 or other material at the end of the lever coming in contact therewith. The detector-lever 11 in descending comes in contact with the cross-wire 10 of the slip-lever 8 9, and this slip-lever stops the rotation of the bobbin 3 by causing the slip 7 to be introduced between the bobbin 3 and drum 1.

When the slip-lever 8 9 is moved back by means of the hand-lever 6—a stud on which strikes the arm 8 of said lever 8 9—the cross-wire 10, carried by the arm 9, comes into contact with and raises all the detector-levers 11 into their acting positions, and in doing so also lifts a separate lever or loose piece, 38, centered on the same wire as the detector-levers 11, which piece 38 on the hand-lever 6, being afterward drawn forward to restart the winding action, bears down the forward arm 10 9 of the slip-lever, so as to be quite free from the detector-levers 11, but only to a short distance, determined by the limited movement allowed to the piece 38 in consequence of its outer end turning up against the bracket 12. The movements of the detector-levers 11 are similarly limited by their outer ends turning up against the rail 13, and the upward movement of their inner ends, when being raised by the cross-wire 10 of the slip-lever, is checked

by their encountering a plate, 39, preferably of an elastic character, fixed to the under side of the rail 13.

Our improved arrangement of detector-levers 11 and parts connected therewith, herein described and delineated, has the very important practical advantage that the unbalanced weight of the detector-levers 11, which weight has to be supported by the ends 16, can be made extremely small, so that the apparatus will work satisfactorily with very light yarns, as well as with strong yarns or threads.

Instead of the detector-levers 11 falling against the drum 1, a separate revolving drum or pulley may be introduced for them to fall against, and for hastening and enforcing their downward action on the slip-lever.

We do not claim in this application the devices for raising the spool-holder and slip-levers, or the combination of the detector-levers, slip, and slip-levers, as these features form the subject of separate applications filed on the same date as the present application.

We claim as our invention—

1. The combination of the driving-drum and the slip-lever 8 9, carrying the slip 7 and cross-wire 10, with detector-levers having frictional pieces 15, adapted to come in contact with a revolving drum, substantially as described.

2. The combination of the detector-levers 11, and pivoted slip-lever 8 9, carrying a cross-wire, 10, with the pivoted piece 38, for bearing down the forward part of the slip-lever a short distance below the detector-levers, substantially as specified.

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