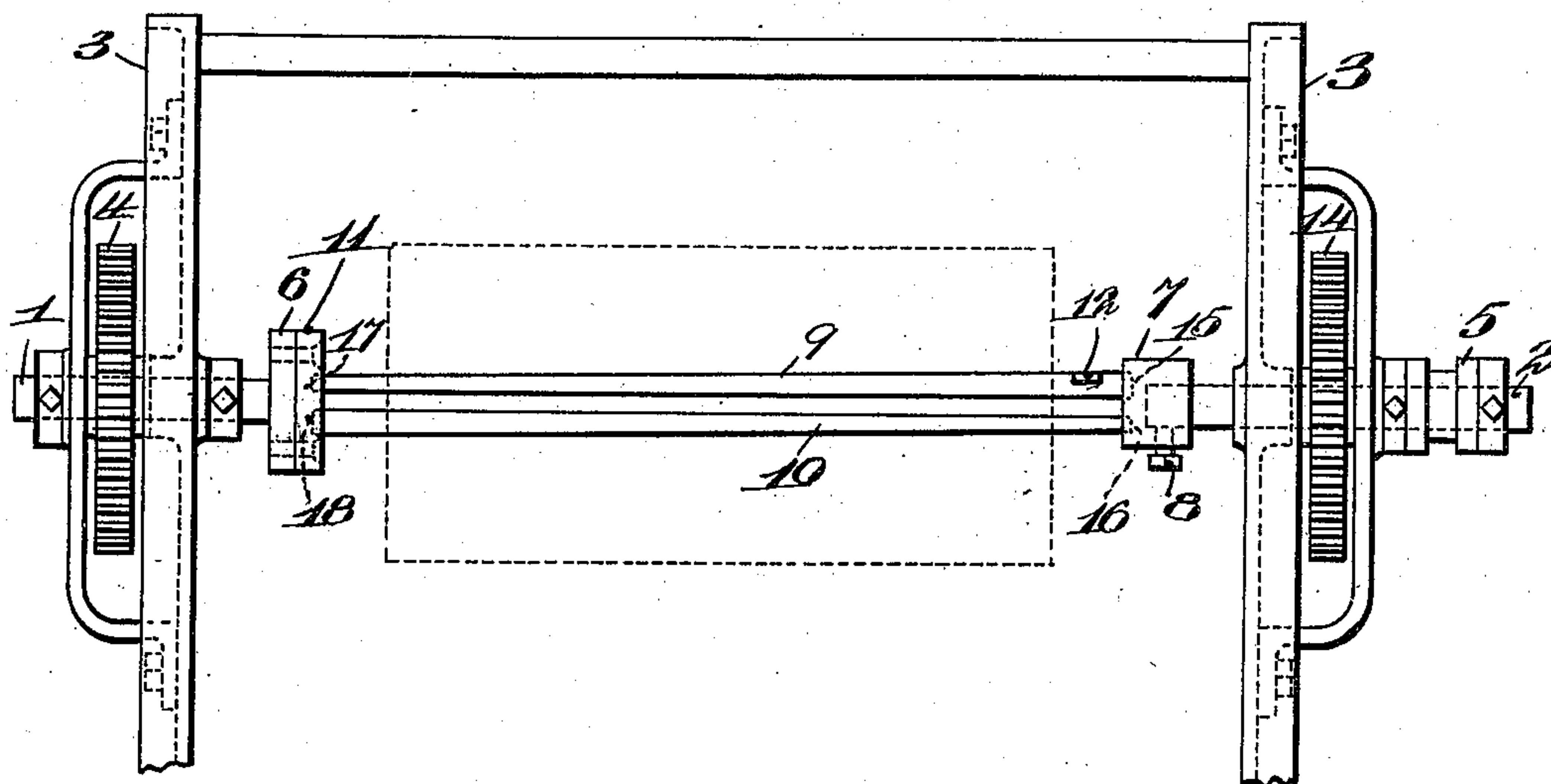


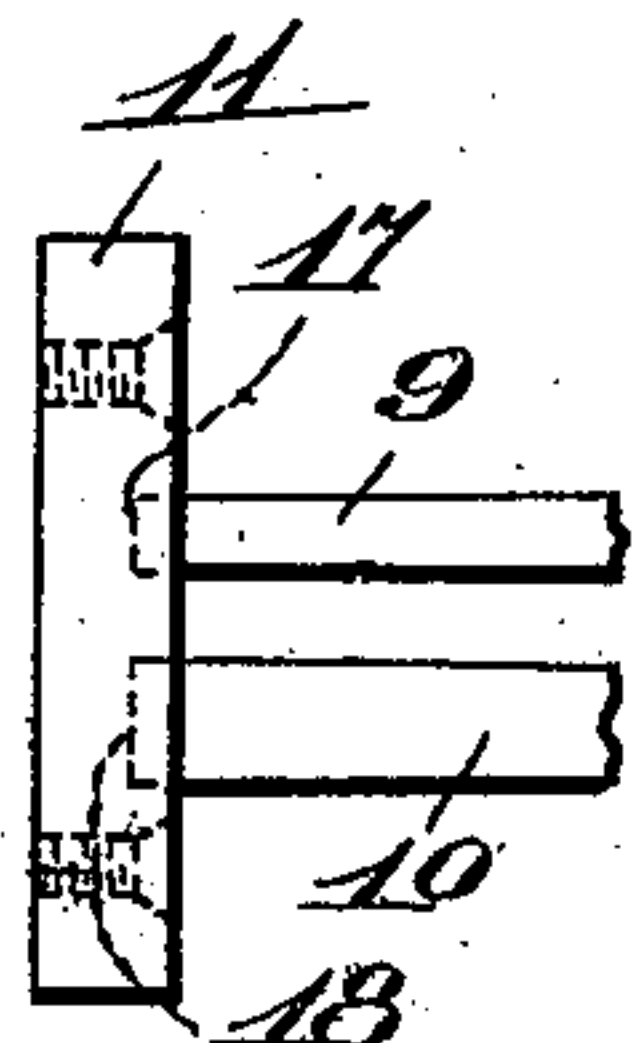
L. H. BALLOU.  
WINDING MACHINE.  
APPLICATION FILED APR. 11, 1910.

983,600.

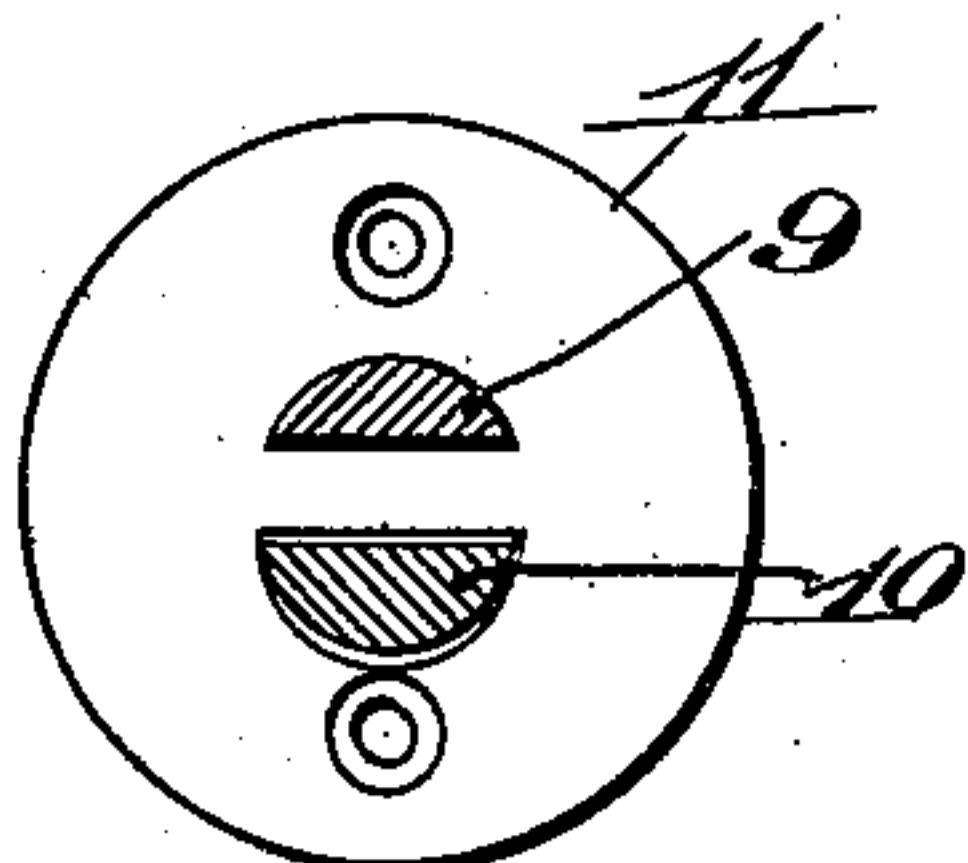
Patented Feb. 7, 1911.



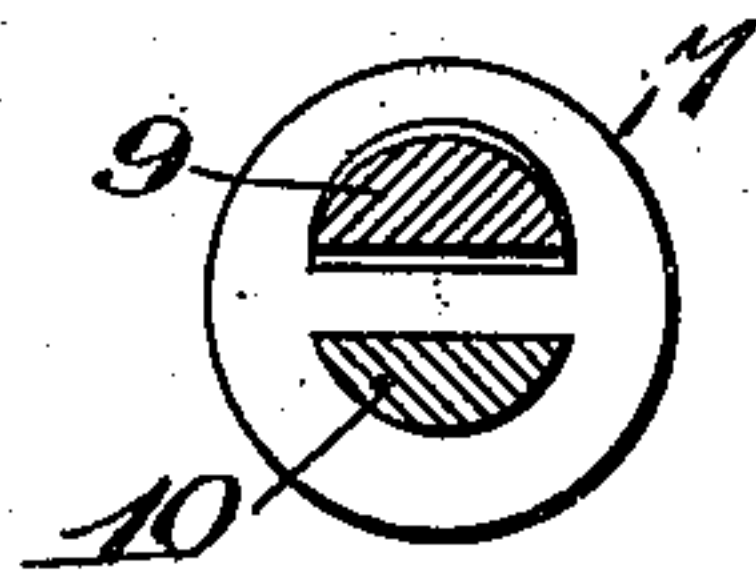
*Fig. 1*



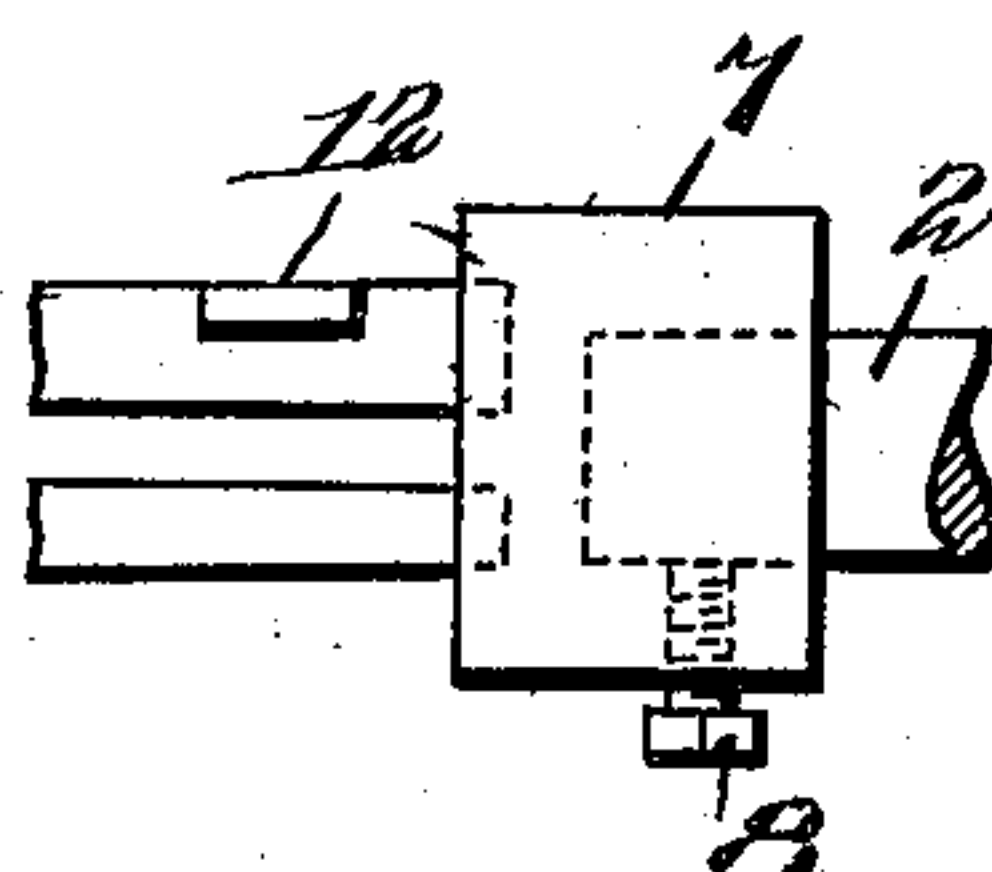
*Fig. 2.*



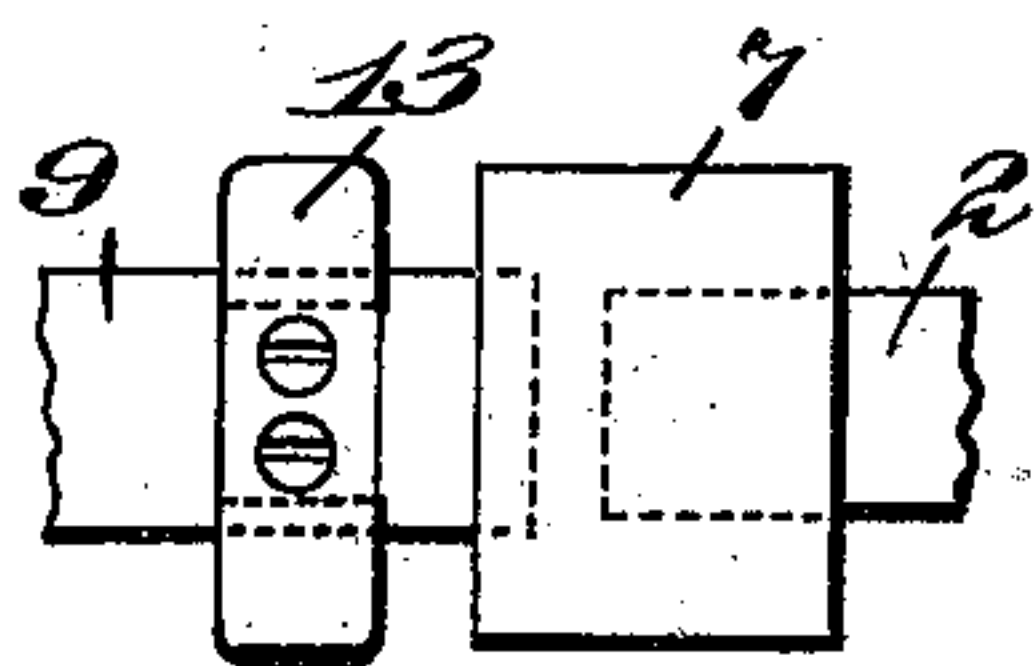
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



*Fig. 6.*

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# UNITED STATES PATENT OFFICE.

LATIMER H. BALLOU, OF LAWRENCE, MASSACHUSETTS.

## WINDING-MACHINE.

983,600.

Specification of Letters Patent.

Patented Feb. 7, 1911.

Application filed April 11, 1910. Serial No. 554,608.

*To all whom it may concern:*

Be it known that I, LATIMER H. BALLOU, a citizen of the United States, residing at Lawrence, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Winding-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to certain new and useful improvements in winding machines, and more particularly to winding arbors or spindles for use in cloth or other winding machines. In machines of this type as heretofore constructed it has been customary to provide a winding arbor comprising a pair of bars permanently connected and held apart at one end, the other ends of the bars being generally supported or held apart only during the winding operation. Upon removal of the arbor from the machine the bars comprising the arbor will spring tightly together at one end, owing to the pressure of the tightly wound cloth, and the fact that the opposite ends of the bars are still held apart. This causes the bars to bind tightly upon the end of the cloth held between them, rendering the removal of the arbor from the roll of cloth difficult, and tending to draw the end of the cloth out of the roll with the arbor.

The object of my invention is to provide an improved winding arbor upon which the cloth may be wound, and which may be easily removed from the roll of cloth at the conclusion of the winding operation.

With the above object in view, the invention consists of the winding arbor hereinafter described and particularly defined in the claims.

In the accompanying drawings Figure 1 represents an elevation of a winding machine with my improved winding arbor applied thereto; Figs. 2 and 3 are details showing a side and front elevation respectively of the left-hand end of the winding arbor, with a portion broken away and shown in section, and showing the means by which the arbor is attached to the fixed winding shaft of the machine; Figs. 4 and 5 are details showing a front and side elevation respectively of the right-hand end of the winding arbor, with a portion of the arbor broken away and shown in section, and

showing the means for attaching the winding arbor to the longitudinally movable shaft of the winding machine; and Fig. 6 is a detail illustrating the construction of my improved finger piece.

In the preferred embodiment of the invention illustrated in the drawings, the winding apparatus is mounted in a winding machine comprising a fixed winding shaft 1 and a longitudinally movable shaft 2 mounted in the frame 3 of the machine. The shafts 1 and 2 are both rotated at the same rate of speed by the gears 4 and 14 respectively. The gear 14 is keyed to the shaft 2 to rotate with the same, but is slidable longitudinally on the shaft. The shaft 2 is slid longitudinally in the frame by any convenient mechanism, the preferred mechanism employed in the present instance comprising a collar 5 fixedly mounted upon the shaft, and a forked lever (not shown) operatively connected thereto to move the same. The winding arbor comprises two unconnected bars 9 and 10 which are spaced apart during the winding operation. At the conclusion of the winding operation, both ends of the bars are allowed to spring together which relieves the pressure exerted by the roll of cloth upon them and allows the bars to be successively and independently removed from the roll of cloth, owing to the fact that they are not connected with one another. The arbor is supported in the winding machine by heads 6 and 7 which are mounted upon the inner ends of the shafts 1 and 2 respectively. The head 7 is fastened to the shaft 2 by a set screw 8. In order that the bar 9 may be more easily removed from the roll of cloth, a finger piece 12 is provided adjacent one end thereof. The finger piece comprises a short transverse bar 13 mounted upon the upper side of the segmental bar 9 and adjacent to the end of the bar where it will not interfere with the winding of the cloth, and may be easily grasped by the fingers of the operator for removal of the arbor from the roll of cloth.

I am enabled to apply my improved arbor to machines of existing type in which the winding shaft is provided with a head 6 upon the inner end thereof by providing a disk 11 in which the ends of the bars 9 and 10 are mounted, and by fastening the disk to the head 6 by any suitable means. The bars 9 and 10 are detachably supported at



both ends upon the heads 6 and 7. It can readily be seen that owing to this method of supporting the bars 9 and 10, both ends of the bars will be released upon withdrawal of the shaft 2, and the two bars 9 and 10 will be forced together by the pressure of the roll of cloth upon them. Both of the bars 9 and 10 comprising the arbor are conveniently mounted in the preferred form of my invention in recesses 15 and 16 respectively in the head 7, and recesses 17 and 18 respectively in the disk 11. I wish to have it understood that I may, if so desired, support the bars 9 and 10 directly in the head 6 by cutting the recesses 17 and 18 in the face of the same. In order that the bars 9 and 10 comprising the arbor may be more easily removed from the roll of cloth after the same is wound thereon, they are tapered in opposite directions, as may be seen on observing Fig. 1 of the drawings.

The operation of my improved machine is as follows:—The segmental bars comprising the winding arbor having been assembled in the machine, the end of the strip of cloth to be wound is inserted between the bars, and as the winding shafts and arbor are positively rotated, the tension on the opposite end will produce sufficient pressure upon the cloth, after a few turns have been made, to hold the end of the cloth firmly on the arbor. After the finished roll of cloth is wound upon the arbor, the shaft 2 is withdrawn, allowing the end of the arbor with the roll of cloth wound thereon to be released. The ends of the bars which were spaced apart during the winding operation will now spring together as the shaft is withdrawn, relieving the pressure of the cloth upon the arbor. One of the bars by means of the finger piece provided upon it is then pulled endwise from the roll of cloth. The tapering formation of the bars 9 and 10 enables them to be withdrawn easily without danger of disturbing the cloth in the center of the roll, and as only one bar is withdrawn

at a time, the pull upon one face of the cloth due to the friction of the stationary part tends to keep the cloth in place, and neutralizes the pull upon the opposite face of the cloth due to the bar which is being removed and which tends to pull the end of the cloth out of the roll.

Having explained the nature and object of the invention, and specifically described one form in which it may be embodied, what I claim is:—

1. A winding machine, having, in combination, a winding shaft having a head provided with recesses, a winding arbor comprising a pair of unconnected oppositely tapered bars removably supported at one end in said recesses, a second shaft removable relative to said winding shaft, having a head provided with recesses adapted to removably receive and support the other ends of said bars, and means for driving the shafts whereby a roll of cloth may be removably wound upon the arbor without torsion to the arbor, and the arbor with the roll of cloth thereon bodily removed from the machine, collapsed so that its bars are free from the roll and removed from the roll without disturbing the inner coils of the roll.

2. A winding machine, having, in combination, a winding shaft, a second shaft, movable relative to said winding shaft, means for driving said shafts, a winding arbor comprising a pair of unconnected oppositely tapered spaced bars, means for detachably supporting said bars upon the inner ends of the shafts, and a finger piece mounted transversely upon one of the bars adjacent the end thereof, whereby the bar may be more easily removed from the cloth after the winding operation is completed.

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