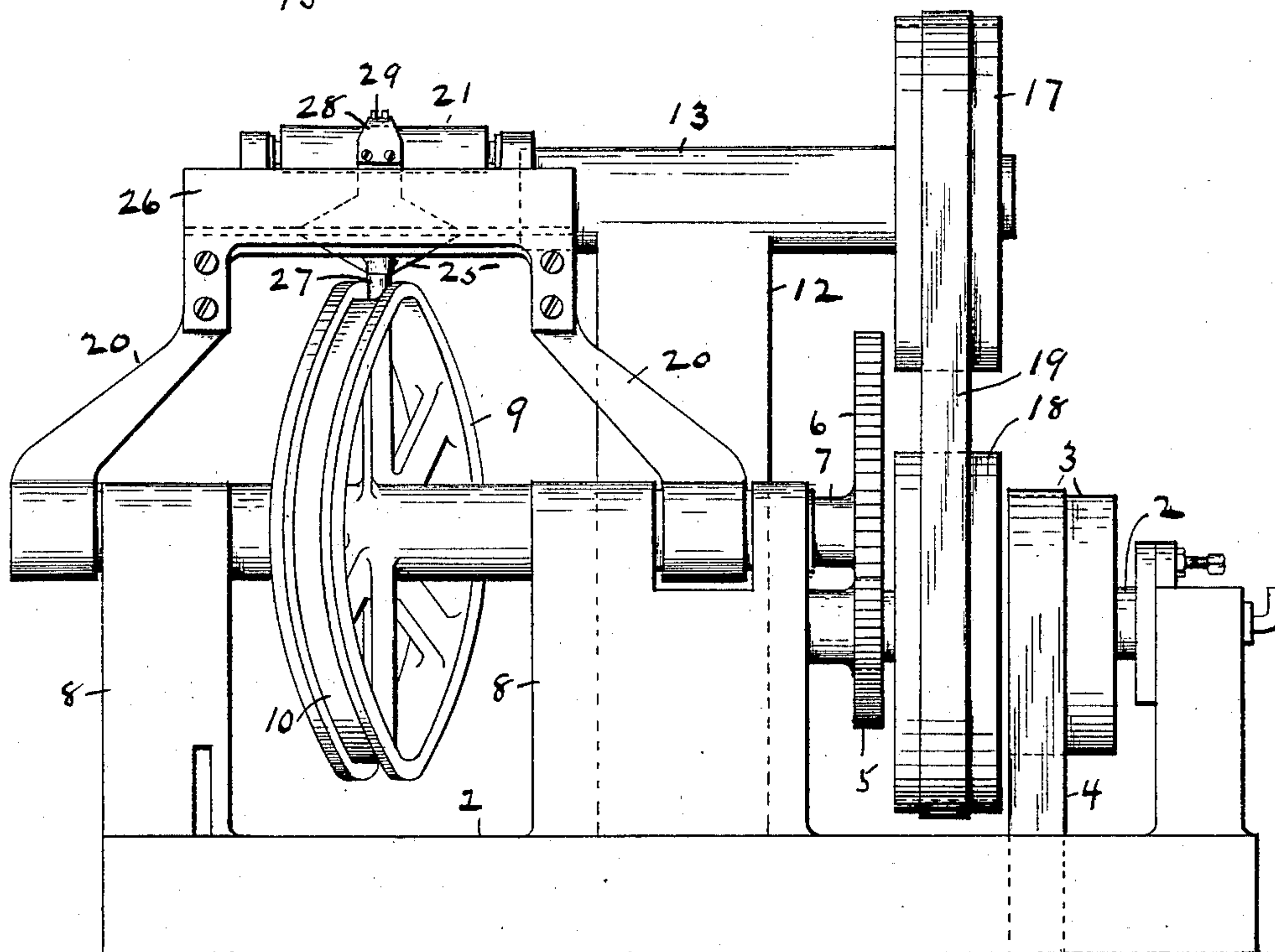
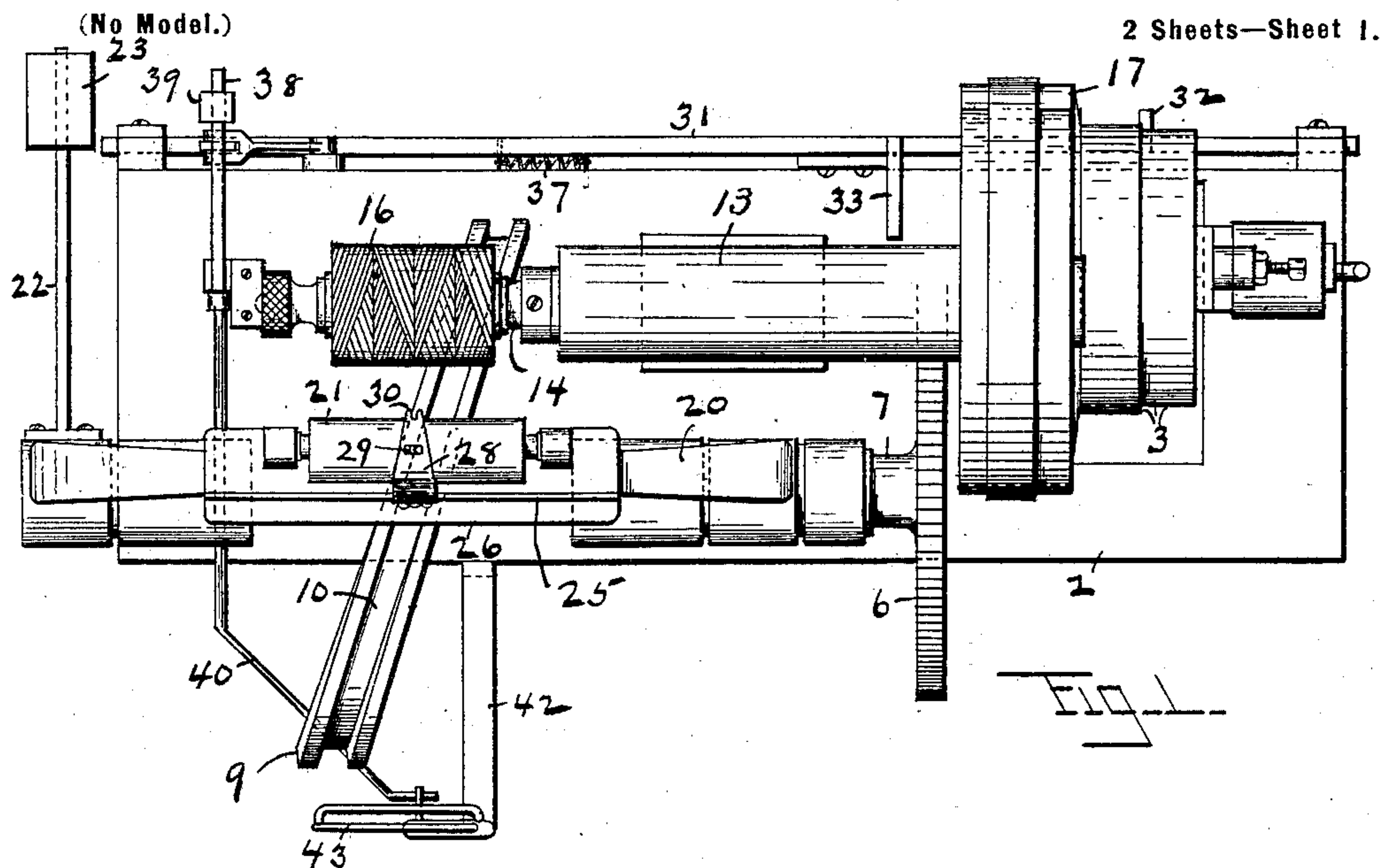


No. 630,343.

Patented Aug. 8, 1899.

S. M. GREEN.  
WINDING MACHINE.

(Application filed Dec. 2, 1897.)



Witnesses.

C. H. Warner  
J. E. Chapman

Fig. 2

Inventor.

S. M. Green  
By M. J. Chapman

Attorney.

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2 Sheets—Sheet 2.

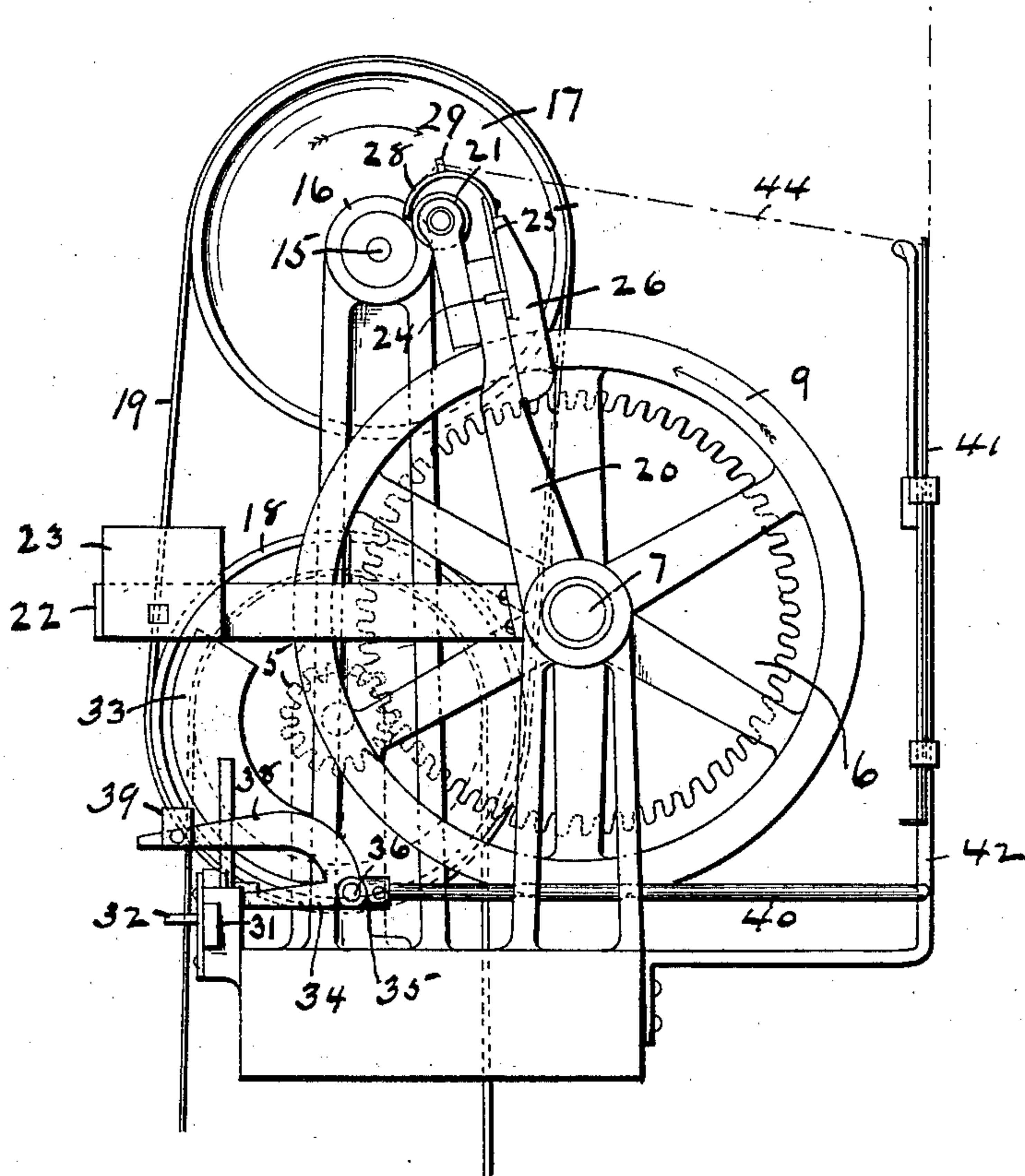


Fig. 3.

Witnesses.

J. E. Chapman  
L. H. Warner

Inventor.

S. M. Green  
By M. J. Chapman

Attorney.



# UNITED STATES PATENT OFFICE.

SAMUEL M. GREEN, OF HOLYOKE, MASSACHUSETTS.

## WINDING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 630,343, dated August 8, 1899.

Application filed December 2, 1897. Serial No. 660,484. (No model.)

*To all whom it may concern:*

Be it known that I, SAMUEL M. GREEN, a citizen of the United States, residing at Holyoke, in the county of Hampden 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.

My invention relates to thread-winding machines of the class in which the thread is laid upon the bobbin by a reciprocating or vibrating thread-guide which traverses from end to end of the bobbin, in connection with a presser-roll which bears against the bobbin and prevents any disarrangement of the layers of thread.

The object of the invention is to provide such machines with a form of thread-guide which will secure a more accurate delivery of the thread to the bobbin and enable the machine to be operated at a higher speed than has heretofore been practicable.

To this end the invention consists in the combination, with a winding-machine of the class mentioned, of a thread-guide constructed and operating as hereinafter fully described, and particularly pointed out in the claims.

Referring to the drawings, in which like numerals designate like parts in the several views, Figure 1 is a plan view of a winding-machine embodying the invention. Fig. 2 is a side view thereof with the stop-motion mechanism omitted. Fig. 3 is an end view of the same, looking toward the left in Figs. 1 and 2, with the thread-guide and presser-roll in their working position.

The frame 1 of the machine is provided with suitable bearings for supporting the main shaft 2, which carries fast and loose pulleys 3, by which motion is communicated to said shaft through a belt 4. Said shaft also carries a spur-gear 5, which meshes with a large gear 6, carried by a shaft 7, which shaft is supported in bearings on standards 8 of the frame and carries between said standards the cam-wheel 9, having the peripheral groove 10, which forms an ellipse. At the upper end of a standard 12 on the frame is a long bearing 13, which supports the spindle-

shaft 14, said shaft carrying at one end the winding-spindle 15, upon which the bobbin 16 is wound, and at its opposite end the pulley 17, which pulley is connected with an oppositely-inclined pulley 18 on the main shaft 2 by a belt 19. The pulleys 17 and 18 are slightly tapered, but not sufficient to indicate in the drawings on the scale therein shown, and the faces of the pulleys are wider than the belt 19. By shifting said belt 19 upon said cone-faced pulleys any desired degree of difference in speed between the spindle-shaft 14 and cam-shaft 7 can be secured, as is common in this class of machines. A frame 20, loosely hung on the cam-shaft 7, carries at its upper end the revoluble presser-roll 21 and is provided with the forwardly-projecting arm 22, upon which is mounted the weight 23, the action of which is to tilt the frame 20 forwardly in such manner as to hold the roll 21 against the bobbin 16 with a considerable degree of pressure, while permitting it to yield to the increasing diameter of the bobbin. At the rear of said presser-roll the frame 20 is provided with a groove extending parallel with the axes of said roll and the winding-spindle, into which groove projects a rib 24 on the front side of a slide-plate 25, a back piece 26, secured to the said frame 20 at the rear of said slide-plate, serving to maintain the latter in such position while permitting it to reciprocate freely upon the frame. Said slide-plate carries the depending stud and antifriction-roll 27, which enters the groove 10 of cam-wheel 9, whereby said slide-plate is given one complete reciprocation with each revolution of said wheel. To the upper end of said slide-plate is secured the thread-guide 28, consisting of a narrow strip, preferably of sheet-steel, which is curved forwardly and downwardly, as shown in Fig. 3, to cause its front end to enter between the presser-roll and the bobbin, said end terminating immediately adjacent to the point of contact between said roll and bobbin. On its upper side the thread-guide is provided with the guiding pins or studs 29, between which the thread is guided, and at its front end it is provided with the thread-guiding notch 30 to cause the thread to follow it in its traversing movement. By so constructing said thread-guide as to cause it to



deliver the thread to the bobbin at the point of contact of the latter with the presser-roll every layer of thread on the bobbin is deposited and forcibly held in close contact with the preceding layer in such manner as to form a more compact bobbin than can be wound with the delivering end of the thread-guide in any other position, and this is especially true of a bobbin of the character shown, in which each layer of thread extends from end to end of the same. Such perfect control of the thread during the entire operation of winding a bobbin enables the bobbin to be wound at a considerably higher speed than has been practicable with the forms of thread-guide heretofore employed.

The machine herein shown is provided with a stop-motion mechanism comprising a sliding bar 31, carrying belt-shifting pins 32, engaging the belt 4, and a brake-shoe 33, adapted to engage a web on the inner face of the cone-pulley 18 and having a notch in its upper edge into which drops an arm 34 on a lever 35, pivoted at 36 on the machine-frame to normally retain said bar in its retracted position, a spring 37 serving to press said bar in a direction to shift the belt 4 to the loose pulley and to force the brake-shoe 33 against pulley 18. The lever 35 is provided with another forwardly-projecting arm 38, carrying the weight 39, and with a rearwardly-extending arm 40, the end of which underlies the lower end of a drop-wire 41, which is guided for vertical movement upon a standard 42 and carries at its upper end a loop 43, through which the thread passes and by which it is normally retained in its elevated position. The thread 44 is led from the supply spool or reel (not shown) through said loop 43 on the drop-wire and from thence between the pins 29 and through the notch 30 on the thread-guide to the bobbin, and when the thread breaks the drop-wire falls and rocks the lever 35, thereby releasing the bar 31, which causes the instant stoppage of the machine, as described. Such stop-motion mechanism and the particular means for securing the reciprocating movement of the thread-guide may be varied as may be desired, the means herein shown for securing said functions being shown merely as illustrations of the various forms of such means which can be utilized.

It will be obvious that so far as my present invention is concerned it is immaterial whether the presser-roll and thread-guide be movable toward and away from the bobbin, as herein shown, or whether the said roll and guide be mounted in stationary bearings and the bobbin-spindle be supported in movable bearings and pressed against the presser-roll to secure the result herein described; but I prefer to make the presser-roll the movable member, as shown.

It will be noted that the thread-guide devised by me does not come in contact with the surface of the bobbin during any portion

of the winding operation of the latter, thereby obviating any fraying of the thread and enabling the bobbin to be wound at a much higher rate of speed than is possible when a thread-guide is used which bears upon the surface of the bobbin.

Having thus fully described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a winding-machine, the combination with a rotating spindle, means for driving the same at a varying speed, a yielding frame, a presser-roll carried by said frame in contact with the bobbin on said winding-spindle, ways on said frame parallel with the axis of said presser-roll, a thread-guide having a reciprocating motion along said ways and means for imparting a determinate reciprocating motion to said thread-guide, substantially as described.

2. In a winding-machine, the combination with a shaft carrying a winding-spindle, a presser-roll mounted upon a pivoted support whereby it is movable toward and away from the face of a bobbin on said spindle, means for exerting an elastic pressure upon said support to press said roll against the bobbin during the winding of the latter, a thread-guide mounted upon said pivoted support and adapted for longitudinal movement thereon in a plane parallel with the axis of said roll, a shaft carrying a face-cam which engages said thread-guide for imparting a reciprocating movement thereto, a main driving-shaft, and means for transmitting movement from said main shaft to said spindle and cam shafts.

3. In a winding-machine, the combination of a rotating winding-spindle, a yielding frame, a presser-roll carried by said frame, a thread-guide carried by said yielding frame, said guide being curved over said presser-roll and having guide-pins over said roll and an eye in its end, whereby the thread is delivered in a line tangential to the presser-roll and in juxtaposition to its point of contact with the bobbin, substantially as described.

4. In a winding-machine, the combination of a winding-spindle, means for rotating said spindle at a varying speed, a pivoted frame, a presser-roll journaled in said frame, a slide-plate sliding in ways on said pivoted frame, a cam by which said plate is reciprocated and curved thread-guide 28 carried by said sliding plate and extending over said presser-roll, said guide having guiding-pins 29 and a notch, or eye, 30 in its free end, said free end being included in the angle between the presser-roll and the bobbin, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

SAMUEL M. GREEN.

Witnesses:

WM. H. CHAPMAN,  
C. H. WARNER.