

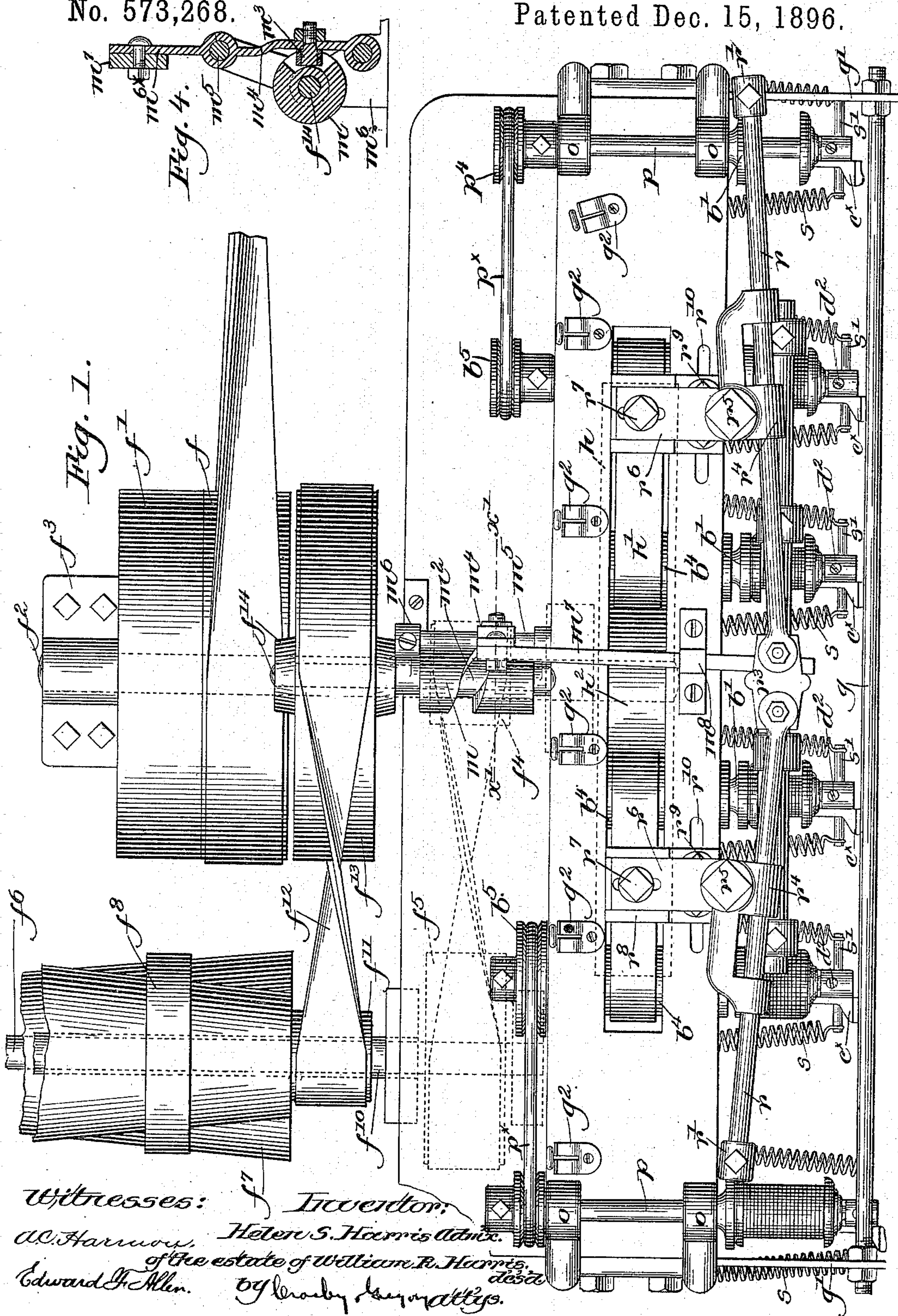
(No Model.)

2 Sheets—Sheet 1.

W. R. HARRIS, Dec'd.
H. S. HARRIS, Administratrix.
MACHINE FOR WINDING YARN.

No. 573,268.

Patented Dec. 15, 1896.



Witnesses:

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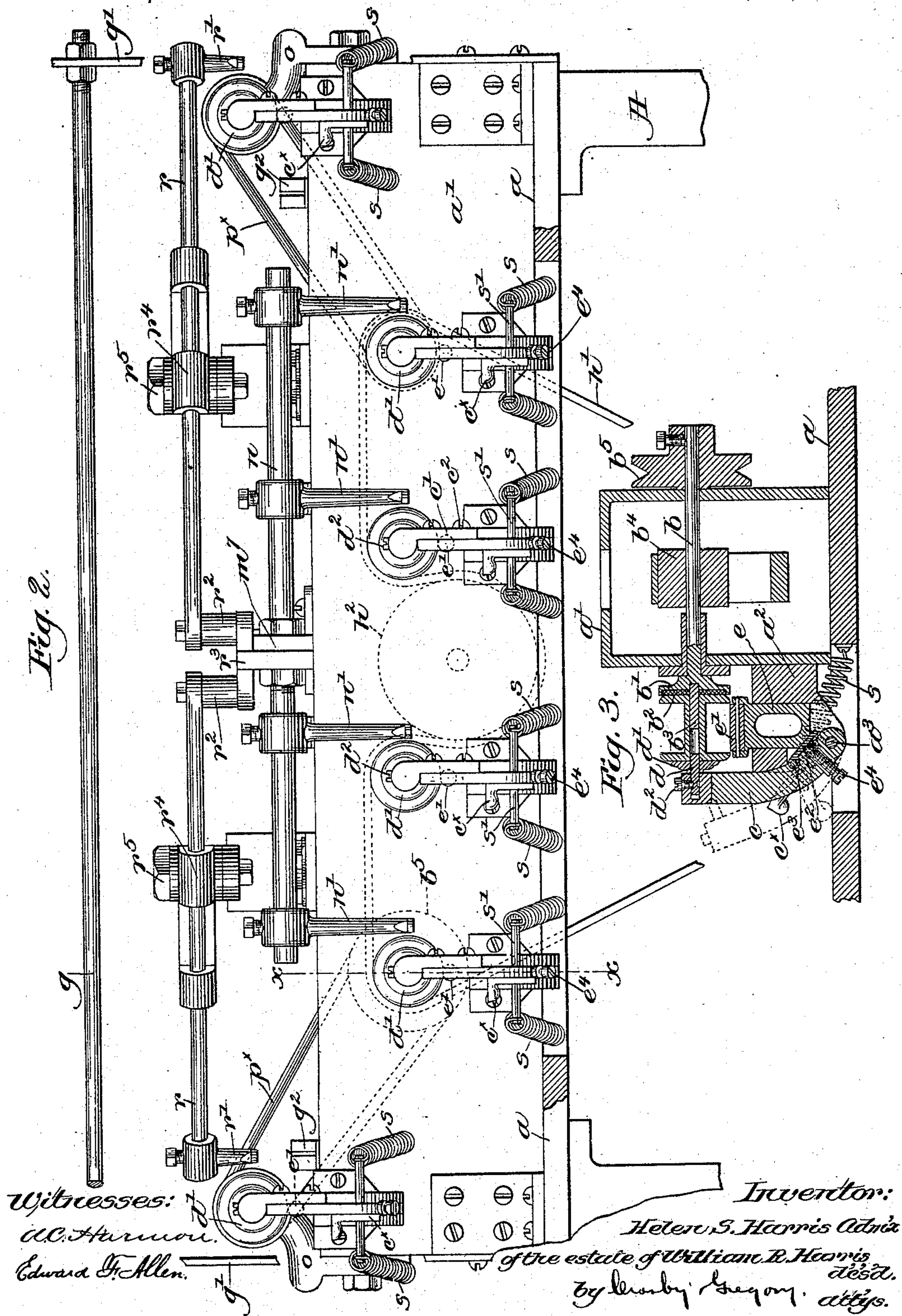
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UNITED STATES PATENT OFFICE.

HELEN S. HARRIS, OF LOWELL, MASSACHUSETTS, ADMINISTRATRIX OF
WILLIAM R. HARRIS, DECEASED, ASSIGNOR TO GEORGE W. HARRIS,
OF SAME PLACE.

MACHINE FOR WINDING YARN.

SPECIFICATION forming part of Letters Patent No. 573,268, dated December 15, 1896.

Application filed January 13, 1896. Serial No. 575,323. (No model.)

To all whom it may concern:

Be it known that WILLIAM R. HARRIS, deceased, late of Lowell, county of Middlesex, State of Massachusetts, did invent an Improvement in Machines for Winding Yarn, Strings, and the Like, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

The invention consists in various novel features to be hereinafter described, and particularly pointed out in the claims.

In the drawings, Figure 1 is a top or plan of a machine containing one embodiment of the invention. Fig. 2 is a front elevation of a portion of the machine shown in Fig. 1. Fig. 3 is a vertical partial section on the dotted line $x x$, Fig. 2; and Fig. 4, a sectional detail on the line $x' x'$, Fig. 1.

In the embodiment of the invention selected for illustration and shown in the drawings, $A A$ are suitable end standards or frame-pieces supporting the bed piece or plate a , on which is arranged a box-like head a' , (see Figs. 2 and 3,) and in this head a' are journaled one or more, preferably a plurality, of winding-spindles b , provided at their outer front ends with suitable friction-drivers b' , shown as heads, provided with faces b^2 , of leather or other suitable friction material, and also preferably provided with the short centering-pintles b^3 .

Some of the spindles b , herein shown as the four middle ones, are provided within the head with driving-pulleys b^4 , the outside pulleys of said middle group of four being also provided at their rear ends outside the heads with grooved or other suitable pulleys b^5 , (see Figs. 1 and 3,) to be referred to.

Secured to the front of the head a' is arranged beneath each of the spindles a short bracket a^2 , to which is pivoted at a^3 the swinging arm c , shown as provided with a separate head c' , adjustably secured to the said arm by suitable means, as the screws c^2 , working in suitable slots in the said head, the latter at its free end having suitably journaled within it the pintle d of the movable presser d' , which latter is also provided with

a short centering projection or pintle, as shown.

The pintle d of the presser d' is retained in the head in a suitable manner, as by the screw d^2 . The spool on which the thread, yarn, or twine is to be wound is positioned between the presser d' and the driver b' , the pintles and the presser and driver, respectively, entering the central bore on the spool and assisting and holding the same in proper position.

The presser is moved toward the driver to firmly clamp the spool between the same in a suitable manner, as by springs $s s$, connected with the bed-plate a and the laterally-extended pins s' on the arm c , said springs being so arranged that when the bracket or arm c is turned down into its dotted position, Fig. 3, the pins s' will be carried below the pivot a^3 to cause the springs to then act to hold the said arm in its lowermost position, the springs holding the arm in either of its two extreme positions, according to the side of the center a^3 on which it is permitted to act.

The bracket a^2 is vertically slotted or provided with other suitable guideways for the vertically-sliding stop e , shown as provided at its upper end with a roller e' , adapted to be acted upon by the body of string or yarn wound upon the spool.

At its lower end the stop e is shown as having one of its corners cut to act upon the stop-plate e^2 , hinged at e^3 to the arm c and seated against an adjustable stop or screw e^4 .

When the body of thread on the spool has been wound to the desired diameter, it will contact with the roller e' and force the latter down, causing it to act upon the stop-plate e^2 to throw the arm c to the left, Fig. 3, to withdraw the presser from frictional contact with the end of the spool to stop the latter, as the friction between the driver and spool-head is not normally sufficient to rotate the spool unless the spool be pressed firmly against the driver by the presser.

A finger-piece c^x is provided with which the operator may throw back the arm c by hand when desired.

Referring now to Fig. 1, f and f' are the

fast and loose driving-pulleys mounted in usual manner upon the main or driving shaft f^2 , journaled in suitable bearings f^3 on the frame or base of the machine, said shaft f^2 being shown as provided with a fast pulley h , about which is passed a belt h' , Fig. 2, which belt also passes over the driving-pulleys b^4 of the four spindles b comprising the middle group, said belt being also preferably passed under a loose pulley h^2 (shown in dotted lines, Fig. 2) to give it the required area of contact with the pulleys b^4 at either side thereof, so that rotation of the driving-shaft causes simultaneous rotation of the four middle spindles through the medium of a single belt. Fast on the driving-shaft f^2 is also arranged a pulley f^4 , (shown in dotted lines, Fig. 1,) connected by a cross-belt with and to drive a pulley f^5 , fast on a shaft f^6 , journaled in suitable bearings in the machine.

The shaft f^6 is shown as provided with a cone f^7 , connected by a belt f^8 with an oppositely-facing cone f^9 on and driving the shaft f^{10} , also journaled in suitable bearings in the frame, said cones f^7 and f^9 , together with the belt f^8 , furnishing means for communicating a variable rotative movement to the shaft f^{10} from the shaft f^6 .

The shaft f^{10} has fast upon it a pulley f^{11} , connected by a cross-belt f^{12} with a pulley f^{13} , fast on a shaft f^{14} , journaled in the head a' of the machine, said shaft in the present instance also constituting a shaft on which the pulley h^2 , referred to, is loosely journaled. On this shaft f^{14} , at the back of the head a' , is fixed a barrel-cam m , the cam-groove m^2 of which receives the roller or other stud m^3 (see Fig. 4) on the carriage m^4 , mounted upon and adapted to slide on the two guide-rods m^5 , supported in one of their ends in the head a' and at their opposite ends in a bracket m^6 , erected on the bed-plate a of the machine. This sliding carriage m^4 , which is given a reciprocating movement by rotation of the cam m , is shown provided with an upwardly-extended arm m^{6x} , to which is connected one end of the rod m^7 , Fig. 1, passed through a suitable guide m^8 , and having its front end perforated to receive the thread-guide rod or bar n , shown as a round rod or bar, on which are adjustably mounted at the proper intervals the thread-guides n' , perforated at their lower ends for the passage therethrough of the thread, yarn, string, or whatever it is desired shall be wound upon the spools, said thread-guides being given reciprocating movements lengthwise the spool and corresponding to the reciprocations of the sliding carriage m^4 .

In the embodiment of the invention herein shown the head a' is provided at or near its opposite ends and preferably near its top with suitable bearings o for other winding-spindles p , provided with drivers and pressers corresponding in construction and operation to drivers and pressers of the other winders and indicated by letters correspondingly in-

dexed, it being deemed unnecessary to further describe the same in detail. These end winding-spindles p are shown as provided at their rear ends, back of the head a' , with grooved pulleys p^4 , adapted to be connected by belts p^x with the pulleys b^5 at the rear ends of the outside spindles of the middle group of four, and in practice the relative diameters of the pulleys b^5 and p^4 may be varied to impart to the respective spindles p or the spools driven thereby a rotation differing in speed from the rotation of the middle spindles in order that different numbers of different cones of yarn and string may be wound simultaneously upon the same machine.

The thread-guides r' for the spindles p are herein shown as adjustably mounted upon the ends of suitable rods r , jointed at their opposite ends to suitable posts r^2 , and a T-shaped bracket r^3 , held rigidly by the carrier-rod n close beside the end of the rod m^7 . (See Fig. 2.)

Intermediate their ends the rods r are mounted in suitable fulcrum-heads r^4 , pivotally mounted at r^5 upon the brackets r^6 , adjustable by means of set-screws r^7 on suitable supports r^8 , in turn adjustably mounted by means of screws r^9 on slots r^{10} upon the head a' .

By reference to Figs. 1 and 2 it will be clear that the reciprocations of the rod m^7 will act through the heads r^4 to rock or vibrate the rods r and cause their thread-guides r' to travel back and forth in front of their respective spools to lay the thread properly thereupon.

By adjusting the position of the fulcrum-heads r^4 , which are made to readily slide upon the rods r , the vibratory movements of the thread-guides r' may be changed as necessary to adapt the same for the different diameters or length of spools employed upon the spindles p for different sizes or qualities of yarn.

In practice the yarns or strings to be wound are drawn from suitable sources over the long guide g , mounted in suitable supports g' on the machine, thence passed through suitable thread-guides g^2 on the head a' of the machine, thence through the movable or vibrating thread-guides n' and r' to the cores of the spools on which they are to be wound.

The winding continues until the respective spools are filled to a diameter determined by the previous adjustment of the automatic stop e , which, when acted upon by the body of the thread, are depressed to stop, as described, their respective spools, leaving the others to rotate, if necessary, for a greater length of time until they too are filled and automatically stopped.

The invention is not limited to the particular embodiment herein shown, for it is evident the same may be varied without departing from the spirit and scope of the invention.

Having described the invention, what is

claimed, and desired to be secured by Letters Patent, is—

1. In a winding-machine, the combination with a rotatable driver, the presser and the swinging support therefor, of the automatic stop adapted on filling of the spool to gradually swing the said support and remove the presser from the driver, substantially as described.

2. In a winding-machine, the combination with a rotatable driver, the presser and the swinging support therefor, provided with a hinged stop-plate and an adjustable support for the same, of the automatic stop movable independently of and adapted to act upon said stop-plate and swing the said arm, substantially as described.

3. In a winding-machine, the combination with a rotatable driver, of a presser, a swinging support therefor, and a spring movable from one to the other side of the fulcrum of said swinging support when the latter is moved from one to the other of its swinging positions whereby the said swinging support tends normally to maintain itself in either of its extreme positions, substantially as described.

4. In a winding-machine, the combination with a plurality of winding-spindles and mechanisms to rotate the same at different rates of speed, of vibrating thread-guides for the said respective spindles, and means to vary the throw of certain of said thread-guides to adapt the same to the spools of the

spindles with which they coöperate, substantially as described.

5. In a winding-machine, the combination with a plurality of winding-spindles and mechanisms to rotate the same at different rates of speed, of vibrating thread-guides for the several spindles and mechanisms to vary the vibratory movements thereof to adapt the same to the different rotative speeds of their respective spindles, substantially as described.

6. In a winding-machine, the combination with the winding-spindles, one set of thread-guides and reciprocating carrier therefor, of the other set of thread-guides and pivotally-mounted carriers therefor connected with and vibrated by the said reciprocating thread-guide carrier, substantially as described.

7. In a winding-machine, the combination with the winding-spindles, of the cam-shaft, the thread-guide-actuating cam thereon, the thread-guide carrier reciprocated from said cam and adapted to guide the thread to one set of spools, and the pivotally-mounted vibrating thread-guide carrier actuated also from said cam and for another set of spools all operating substantially as described.

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Witnesses:

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