(No Model.) 2 Sheets—Sheet 1.

R. MEGOWAN.

WEFT WINDING MACHINE.

No. 373,675. Patented Nov. 22, 1887.

FIG. 1.

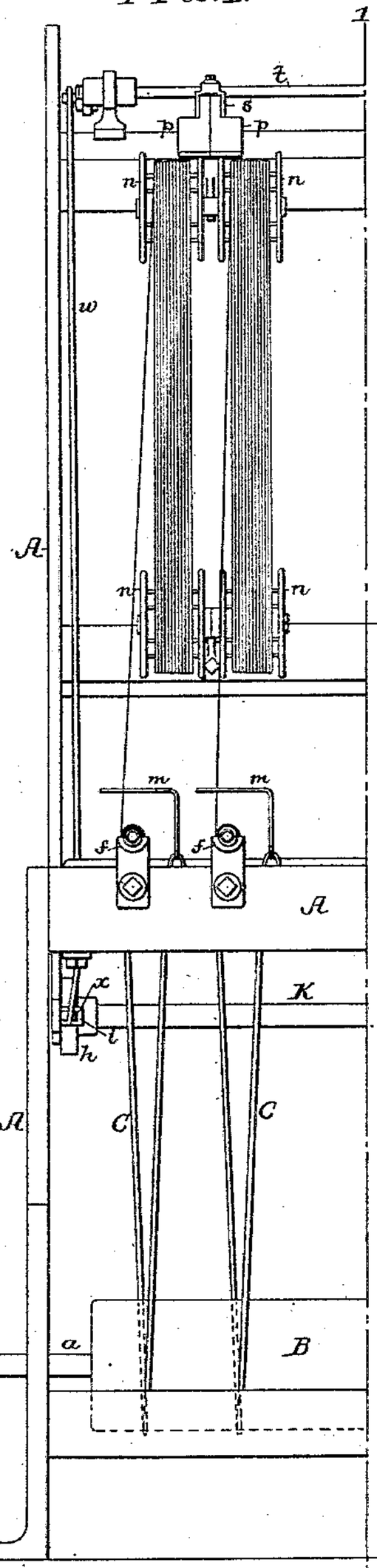


FIG. 11.

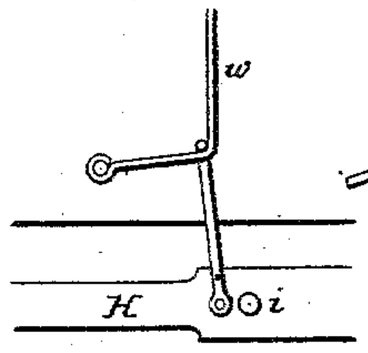


FIG. 10.

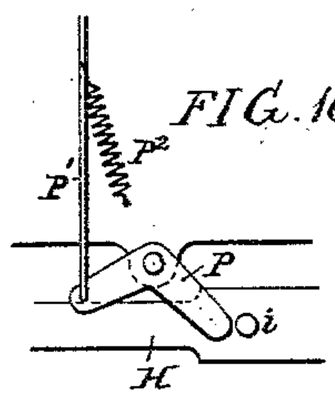


FIG. 2.

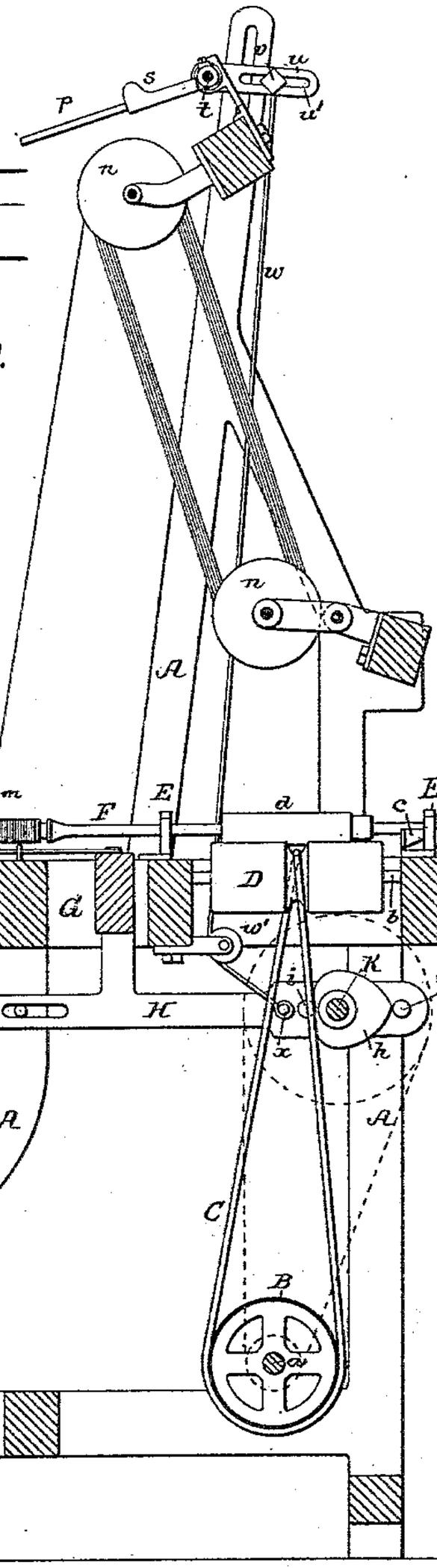


FIG. 6.

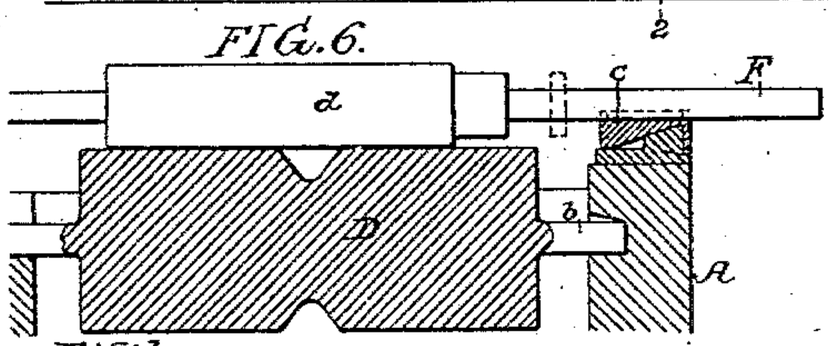
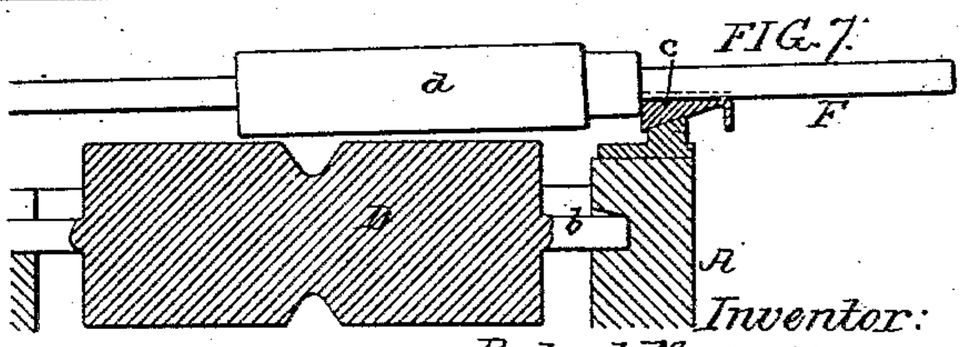


FIG. 7.



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(No Model.) 2 Sheets—Sheet 2.

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WEFT WINDING MACHINE.

No. 373,675. Patented Nov. 22, 1887.

FIG. 4.

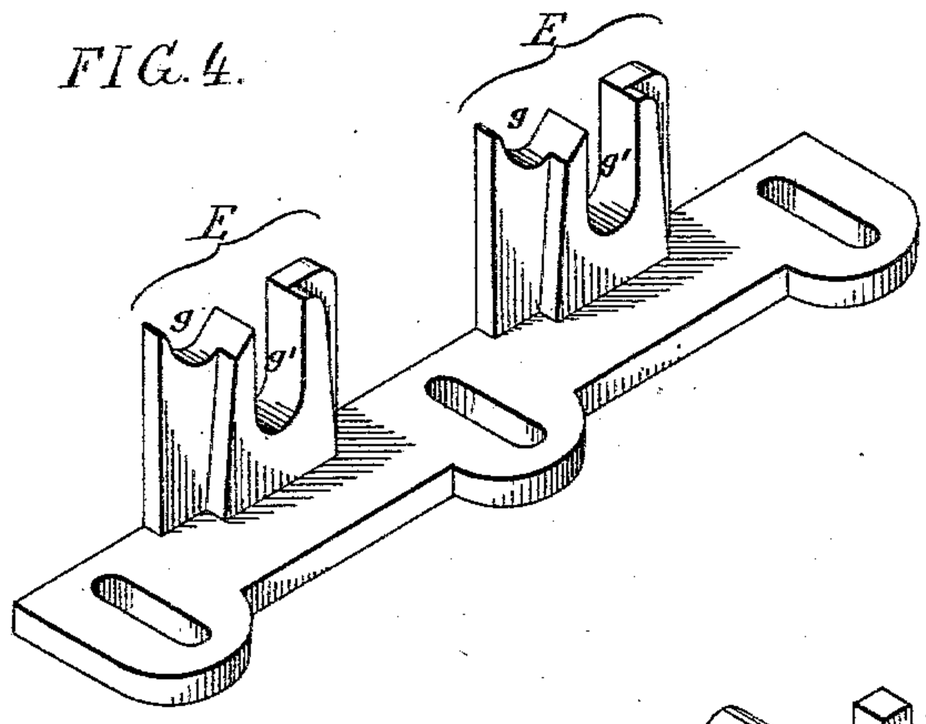


FIG. 9.

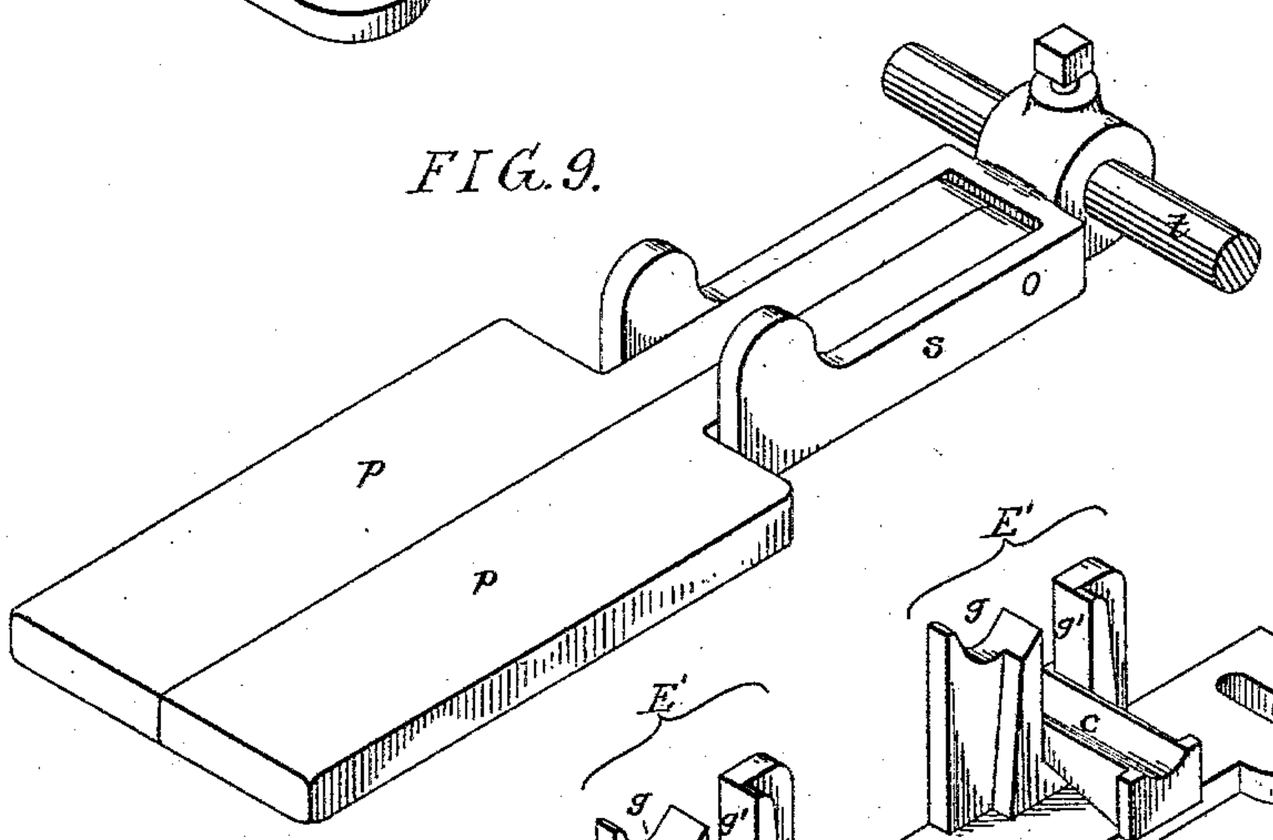
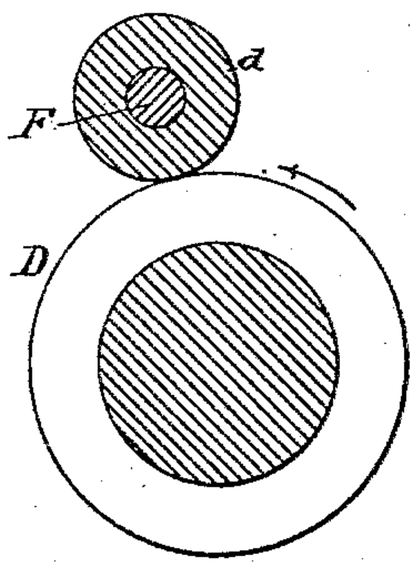


FIG. 3.



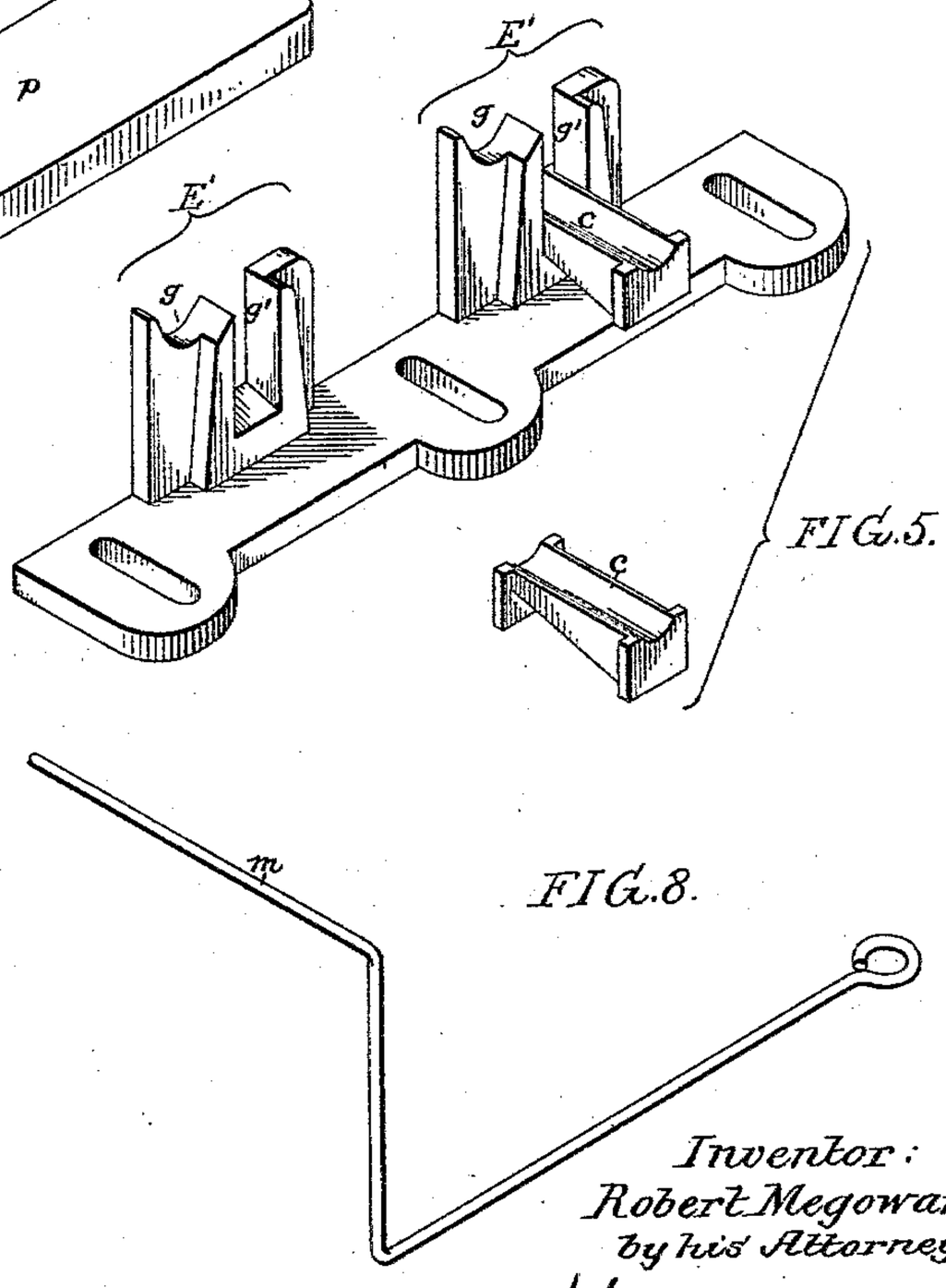


FIG. 8.

FIG. 5.

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UNITED STATES PATENT OFFICE.

ROBERT MEGOWAN, OF PHILADELPHIA, PENNSYLVANIA.

WEFT-WINDING MACHINE.

SPECIFICATION forming part of Letters Patent No. 373,675, dated November 22, 1887.

Application filed June 8, 1886. Serial No. 204,484. (No model.)

To all whom it may concern:

Be it known that I, ROBERT MEGOWAN, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Weft-Winding Machines, of which the following is a specification.

My invention relates to that class of winding-machines in which the nose of the bobbin is contained in a fixed cup or between rollers on the frame of the machine, the spindle moving rearward as the yarn is wound upon the bobbin.

One object of my invention is to so drive the spindle that a uniform rotating movement of high speed may be imparted thereto, which movement can be readily stopped when necessary.

Another object is to effect the automatic stoppage of rotation of the spindle when the latter is full, and a still further object is to prevent overrunning of the reels carrying the skein when the yarn is being wound upon that portion of the nose of the bobbin which is smallest in diameter, the formation of slack yarn being thus avoided, and the danger of breakage, due to the sudden jerk when the slack is taken up, being effectually overcome.

In the accompanying drawings, Figure 1 is a front view of sufficient of a winding-frame to illustrate my invention. Fig. 2 is a transverse section of the same on the line 1 2; Figs. 3 to 9, detached views, on a larger scale, of parts of the machine; and Figs. 10 and 11, diagrams illustrating modifications of part of the invention.

A represents part of the frame of the machine, in which are bearings for the shaft *a* of the longitudinal drum B, and for a series of short transverse shafts, *b*, each of which has a drum, D, centrally grooved for the reception of a driving-belt, C, from the drum B. Upon each of these drums D rests a cylinder, *d*, carried by the winding-spindle F, which is adapted to bearings E E′ on the frame A, in front and rear of the drum D, the front end of the spindle carrying the bobbin and the front bar of the frame A being provided with cups *f* for the reception of the tapering end or nose of the body of yarn which is being wound upon the bobbin, the spindle being gradually forced rearward as the successive courses of yarn are wound upon the bobbin in the usual manner.

In ordinary winding-machines of the class to which my invention relates the belt C is generally applied directly to the cylinder *d* of the winding-spindle—a plan which is objectionable, because the necessary tension of the belt causes such a downward pull upon the spindle that the nose of the bobbin will be pressed firmly in the cup, thus causing the yarn to heat and glaze or burn, owing to the friction. Attempts have been made to overcome this objection by the use of a longitudinal driving band or belt, upon which the cylinder *d* rests, and by frictional contact with which it is driven; but this is also objectionable, as it necessitates the use of means for confining the spindle vertically and keeping the cylinder in frictional contact with the belt, the cylinder in the absence of such confining device having a tendency to jump or dance upon the belt, and thus interfere with the application of a proper uniform high-speed movement of rotation to the spindle.

In carrying out my invention I use for each spindle a single driving-drum, D, upon which the cylinder *d* of the spindle rests, the front end of the spindle being supported by the forming-cup *f*, and the spindle being unconfined vertically, so that there is nothing but the weight of the spindle and the yarn wound thereon to cause friction in the cup, and any desired portion of this weight can be thrown upon the drum by adjusting the axis of the spindle nearer to the vertical line drawn through the axis of the drum, so that the friction on the yarn can be varied as circumstances may suggest. The rotation of the spindle can be instantly arrested by lifting the front end of the bobbin, so that the cylinder is free from contact with the drum; and for the purpose of supporting the spindle in the elevated position each of the bearings E E′ has a shallow slot, *g*, in addition to the deep slot *g′*, which slot *g′* receives the spindle when the cylinder is in contact with the driving-drum. (See Figs. 4 and 5.) Each of the rear bearings, E′, has a sliding block, *c*, to a concave recess in the upper face of which the spindle F is adapted, the under face of each block being beveled and having a bearing upon the beveled base of the slot *g′*, the length of the bearing-block being considerably in excess of that of the stud, (see Figs. 2, 5, and 6,) so that

when, on the rearward movement of the spindle, the rear end of the cylinder *d* strikes the front end of the block *c* the latter will also be moved rearward, and, owing to the beveled faces of the block and bearing, will be caused to rise, so as to lift the cylinder *d* free from contact with the drum D and stop the rotation of the spindle F. (See Fig. 7.) A flange or collar on the spindle F may take the place of the cylinder *d* as a means of actuating the block *c*, if desired. (See dotted lines, Fig. 6.)

The machine has the usual traverse-bar, G, to which a lateral reciprocating motion is imparted by the action of a cam, *h*, upon pins *i* on a guided frame, H, secured to the traverse-bar, said cam *h* being carried by a shaft, K, which may be driven from the shaft *a* by means of the belt and pulleys shown by dotted lines in Fig. 2, or in any other suitable manner. The traverse-bar has bent wires *m*, Fig. 8, one for each bobbin, the yarn passing over the horizontal portion of this wire in its course from the skein to the bobbin, so that there is no lateral confinement of the yarn, and the passage of the latter to the bobbin is permitted with very little friction; hence fine and tender yarns can be wound without difficulty.

When the yarn is being wound upon that portion of the bobbin which is of large diameter, it is drawn from the skein with considerable rapidity, the speed of draft rapidly decreasing as the yarn is directed to that portion of the bobbin at and near the end of the nose, where the diameter is much less. If the speed of the skein-reels *n n* is not checked, therefore, there is a tendency of the yarn to overrun and form slack yarn while winding at and near the end of the nose of the bobbin, and when this slack yarn is taken up, as the yarn is directed toward that portion of the bobbin which is of larger diameter, there is a sudden jerk upon the yarn, which has a tendency to break the same. I therefore provide an automatic brake for the upper skein-reel, this brake consisting of a plate, *p*, loosely hung to an arm, *s*, on a rock-shaft, *t*, adapted to bearings in the upper portion of the frame of the machine, said shaft having another arm, *u*, to a slot, *u'*, in which is adapted a pin or bolt, *v*, connected to the upper end of a cord or wire, *w*, the lower portion of which passes around a pulley, *w'*, on the frame, the lower end of the cord being connected to a pin, *x*, on the frame H of the traverse-bar G. As said frame moves outward, therefore, in order to carry the yarn toward the end of the nose of the bobbin, the cord *w* is slackened and the plate *p* is allowed to fall, so as to rest upon the periphery of the head of the upper skein-reel and serve as a brake therefor, the plate being lifted and the brake removed as tension is imparted to the cord *w* on the rearward movement of the frame H. In the present instance I have shown a pair of spindles, F, and a pair of skein-reels only; but it should be understood that in the working machine a larger number of spindles and skein-reels are employed, the spindles being placed as closely together as circumstances will permit.

Each of the arms *s* is preferably constructed as shown in Fig. 9, so as to carry a pair of brake-plates, *p*, for the adjacent rims of adjoining reels, although each plate may have an independent arm, if desired, and in some cases the arms *s* may serve as brakes, the pivoted plates being dispensed with.

I do not desire to limit myself to the precise means shown in Fig. 2 for operating the brakes for the skein-reels in unison with the movement of the traverse-bar, as these may be modified in various ways without departing from the spirit of my invention. For instance, in Fig. 10 I have shown a modification in which I use a bell-crank lever, P, one arm of which has a rod, P', acted upon by a spring, P^2, and intended to be connected to the arm *u* of the rock-shaft *t*, while the other arm of the lever is acted upon by a pin, *i*, of the traverse-bar frame H, and in Fig. 11 I have shown a cord, *w*, connected at the lower end to a fixed stud on the frame A and acted upon by a pin projecting from the frame H, so as to be alternately tightened and slackened as said frame is reciprocated.

My invention, as will be readily understood, is applicable to machines for winding cops, as well as to the bobbin-winding machine shown and described.

I am aware that it has been proposed to drive a spindle by means of two drums acting on collars or sleeves near the opposite ends of the spindle; but in such case the weight of the spindle is borne wholly by the drums instead of partly by the driving-drum and partly by the forming-cup; hence in this case there is no provision for governing the friction between the yarn and the forming-cup, as in my machine. I am also aware that it has been proposed to drive winding-spindles by means of drums or pulleys placed side by side, the cylinder on the spindle resting between the drums or pulleys and being in contact with each; but in such case the surface speed of both drums must be absolutely the same; otherwise there is a tendency either to wedge the cylinder between the drums or to lift the cylinder from its proper position, irregular speeding of the spindle being the result in either case. It will be evident that the objections to both these plans are effectually overcome by my invention.

I therefore claim as my invention and desire to secure by Letters Patent—

1. The combination of the single driving-drum and mechanism for rotating the same, a forming-cup, a winding-spindle supported at the front end by said forming-cup and having at the rear a cylinder resting upon and driven by frictional contact with said single drum, and bearings in which the spindle is free to move both longitudinally and vertically, all substantially as specified.

2. The combination of a grooved drum, a driving-shaft, and a driving-belt adapted to

the groove of the drum, with a winding-spindle having a cylinder resting upon and driven by frictional contact with the drum, and with bearings in which said spindle is free to move longitudinally, all substantially as specified.

3. The combination of the drum and means for rotating the same, the winding-spindle having a cylinder resting upon and driven by frictional contact with said drum, and bearings for said spindle, having shallow notches for supporting the spindle, so that its cylinder will be free from contact with the drum, and deep notches for receiving the spindle when its cylinder is in contact with the drum, all substantially as specified.

4. The combination of a single driving-drum and mechanism for rotating the same with a winding-spindle having a cylinder resting upon and driven by frictional contact with said drum, and bearings for said spindle, the axial line of the spindle and its bearings being laterally offset in respect to the axial line of the drum, all substantially as specified.

5. The combination of the winding-spindle having a projection thereon, a frictional driver for said spindle, and bearings in which the spindle is free to slide longitudinally, one of said bearings consisting of a beveled stud and a beveled spindle-supporting block free to slide longitudinally on said stud when struck by the projection on the spindle, all substantially as set forth.

6. The combination of the winding-spindle and means for rotating the same, a skein-reel, a thread-guide, reciprocating devices for said guide, a brake for the skein-reel, and means, substantially as described, for operating said brake in unison with the movement of the yarn-guide, all substantially as specified.

7. The combination of the skein-reel, the rock-shaft having a projecting arm, a brake-plate pivoted to said arm, and means for vibrating the said rock-shaft, all substantially as specified.

8. The combination of the winding-spindle and means for rotating the same, the skein-reel, the traverse-bar with its thread-guide and frame H, means for reciprocating the said frame, a rock-shaft, *t*, carrying a brake-plate and an arm, *u*, and a cord or wire, *w*, passing around a fixed bearing and connected at one end to the traverse-bar frame H and at the opposite end to the arm *u*, all substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ROBERT MEGOWAN.

Witnesses:
WILLIAM D. CONNER,
HARRY SMITH.