M. B. WHITE.

WINDING MACHINE.

APPLICATION FILED JAN. 6, 1917.

1,268,905.

Patented June 11, 1918.

3 SHEETS—SHEET 2.

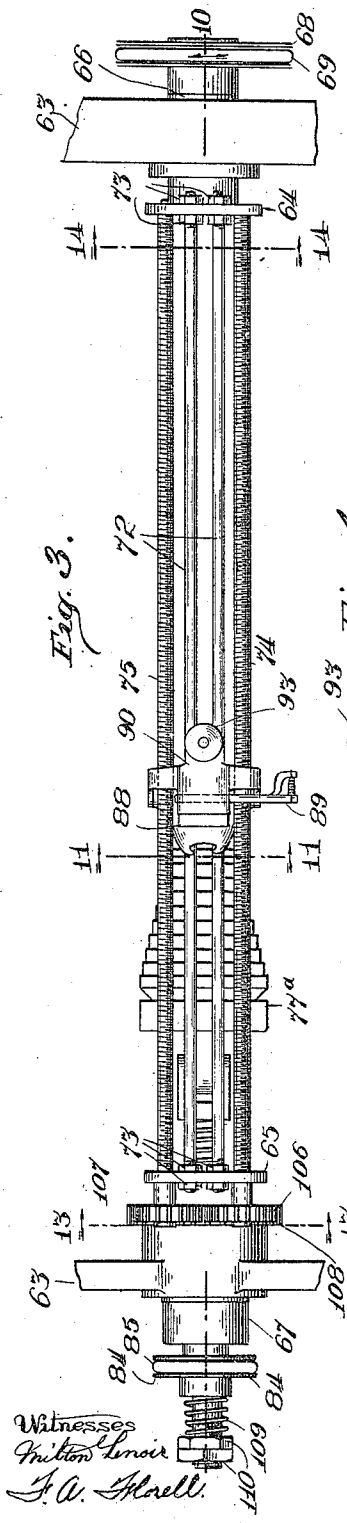


Fig. 3.

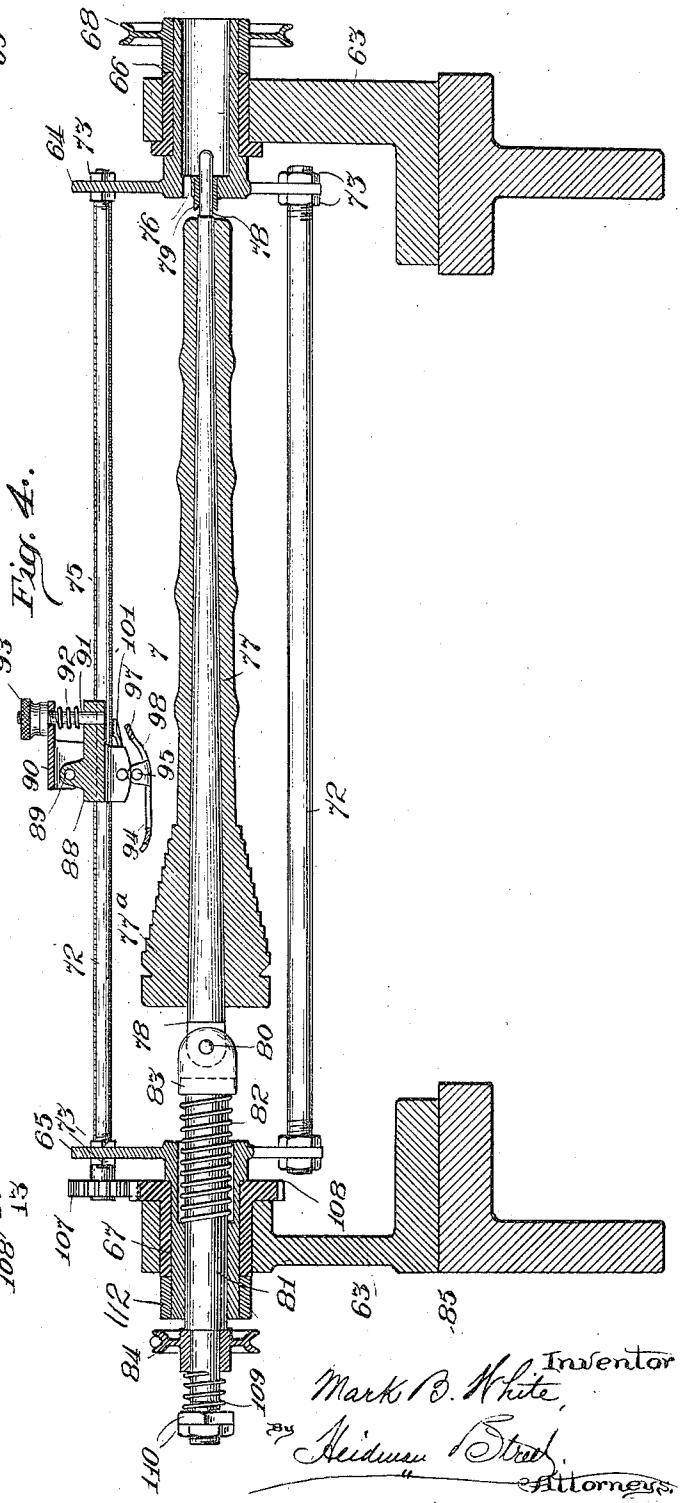


Fig. 4.

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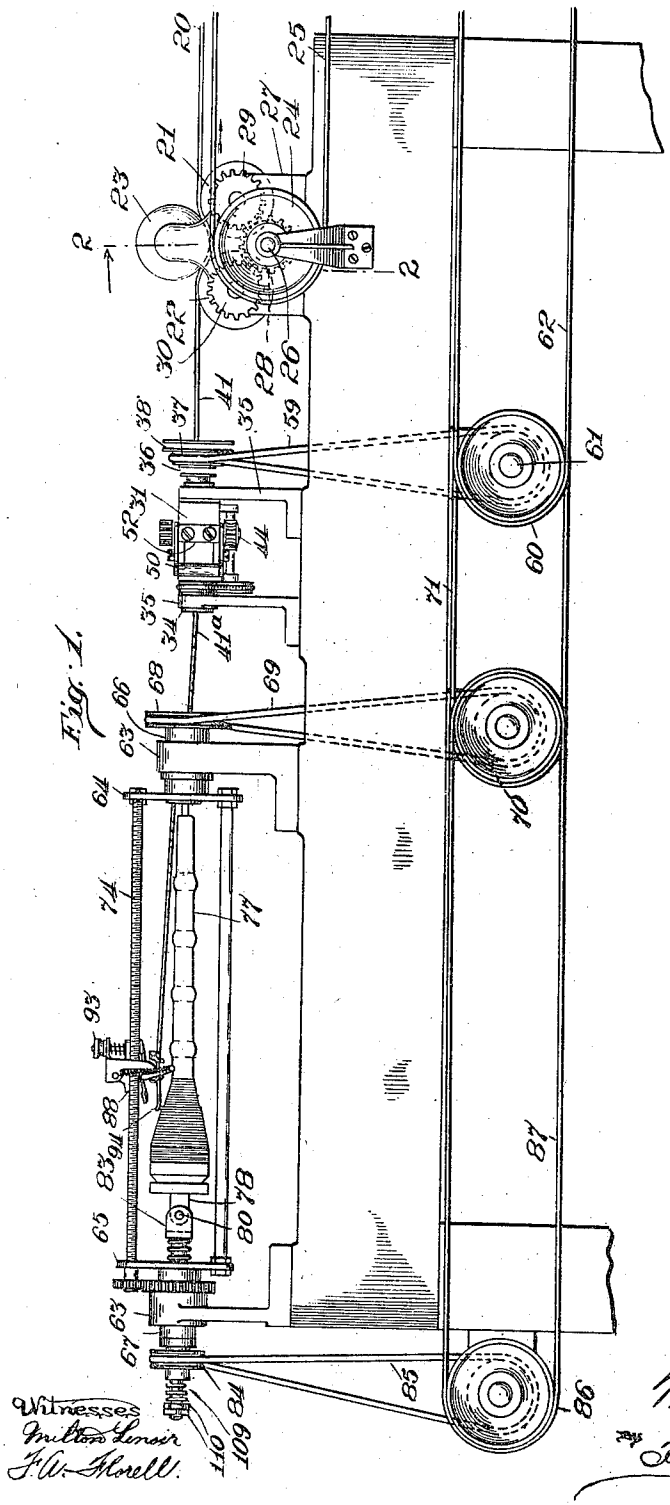


Fig. 1.

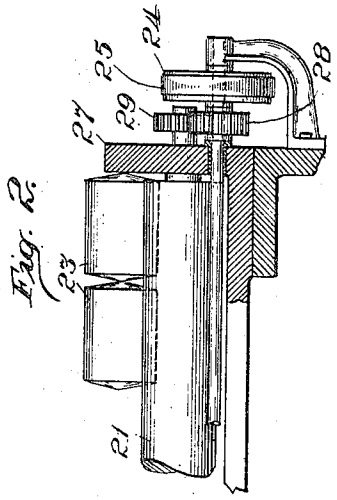


Fig. 2.

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3 SHEETS—SHEET 3.

Fig. 5.

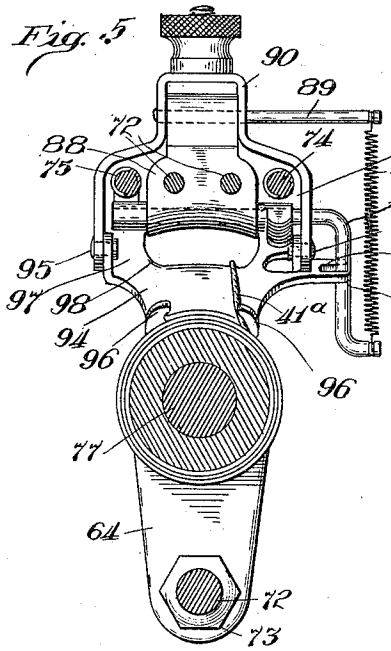


Fig. 6.

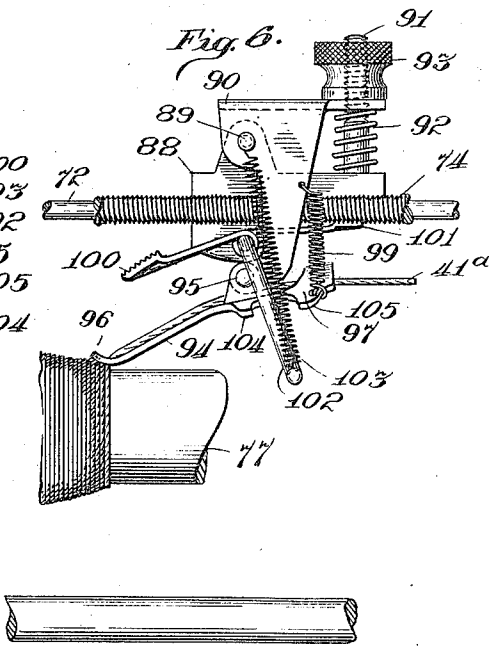


Fig. 7.

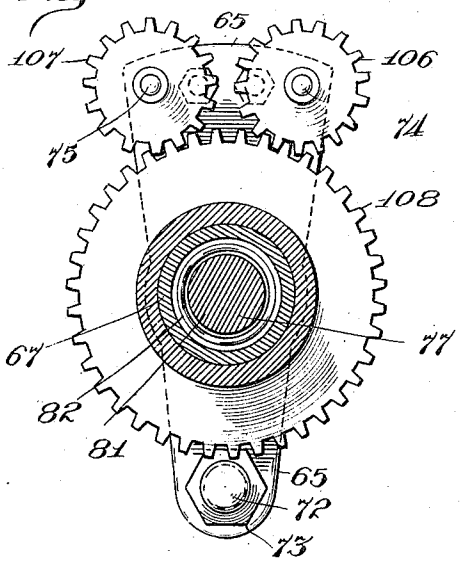
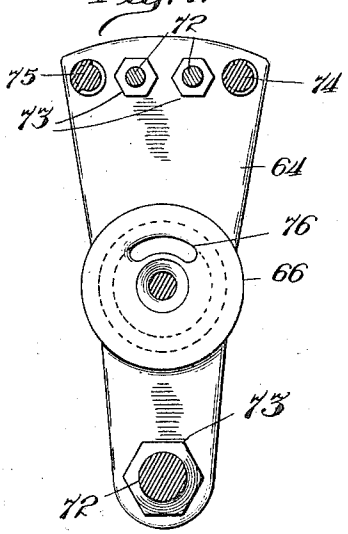


Fig. 8.



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UNITED STATES PATENT OFFICE.

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WINDING-MACHINE.

1,268,905. Specification of Letters Patent. Patented June 11, 1918.

Application filed January 6, 1917. Serial No. 141,019.

To all whom it may concern:

Be it known that I, MARK B. WHITE, a citizen of the United States, and a resident of Hanover, in the county of Jo Daviess and State of Illinois, have invented a certain new and useful Improvement in Winding-Machines, of which the following is a description, reference being had to the accompanying drawings, which form a part of my specification.

The invention contemplates mechanism whereby the twisted yarn or thread is immediately wound on bobbins operated so as to maintain the proper twist of the yarn as it is discharged by or passes from the twisting head or mechanism, with the result that a finished yarn is provided, ready for use on the looms and in the warping department.

A further object of my invention is to provide a construction which will enable more finished yarn or thread to be placed on the bobbins.

The invention will be more fully comprehended from the following detailed description of the accompanying drawings, wherein:—

Figure 1 is a side elevation of a single unit of a composite machine or battery comprising the roving-receiving and tension-applying mechanism, the spinning mechanism and the winding mechanism.

Fig. 2 is a detail view of the roving-receiving and tension-applying rolls, taken on the line 2—2 of Fig. 1, illustrating their arrangement for a battery or plurality of units.

Fig. 3 is a plan view of the winding mechanism.

Fig. 4 is a central longitudinal sectional view of Fig. 3.

Fig. 5 is a detail view of the yarn-controlling device of the winding mechanism, taken on the line 11—11 of Fig. 3, looking in the direction of the arrows.

Fig. 6 is an enlarged detail view in side elevation, of the construction shown in Fig. 5.

Fig. 7 is a cross sectional view, taken on the line 13—13 of Fig. 3, looking in the direction of the arrows.

Fig. 8 is a cross sectional view, taken on the line 14—14 of Fig 3, looking in the direction of the arrows.

In the particular exemplification of the invention, as illustrated in the drawings, a single unit is merely illustrated and only portions of a suitable supporting frame shown; it being understood, of course, that these machines are usually composed of a number of units constituting what may be termed a battery; all of the units being preferably driven from a common drive shaft provided with graduated or stepped pulleys in order to permit the speed of the various units to be varied commensurate with the speed of delivery from the carding machines. As the method of driving the various units of a battery from a common driver or shaft may be the same as the method at present employed, this part of the mechanism has not been elaborately illustrated and need not therefore be minutely described. For the purpose of the present specification, we will assume that my improved machine is to be employed in producing woolen yarn made from the roving as it is discharged from the carding machine. The roving is indicated at 20 in Fig. 1, and is fed between the tension-applying rollers indicated at 21, 22 and 23. As the roving is to be fed directly to the twisting mechanism of my machine, the tension-applying rollers must, therefore, be operated at substantially the same speed as the speed of delivery of the carding machine, and for that reason the pulley 24 receives a belt 25, driven off of a suitable drive-shaft or pulley on the carding machine. The pulley 24 is mounted on shaft 26 having suitable bearings in the brackets 27; the shaft being provided with a pinion 28 adapted to mesh with gears 29 and 30 of rollers 21 and 22, respectively, so that positive rotation will be imparted to the rollers 21 and 22 in similar directions. The brackets 27 extend into horizontal planes above the rollers 21 and 22, at opposite sides of the machine and provide suitable bearings for the ends of the end rollers 23; the latter being disposed in a vertical plane intermediate of the vertical planes of the axes of rollers 21 and 22. The roller 23 is loosely mounted so as to rest on the rollers 21 and 22 and be rotated thereby. In a composite machine or battery, consisting of a number of units, a separate loosely mounted roller 23 is provided for each unit as disclosed in Fig. 2; the abutting ends of the different rollers being preferably provided with a slight conical surface, as shown in Fig. 2, so as to obviate a too great frictional relation between the adjacent ends and at the same time maintain the rollers in proper relation

and therefore in alinement with the discharge portions of the rub rolls or apron of the carding machine. The rollers 23 ride loosely on the lower rolls 21 and 22 and are of weight sufficient to apply the necessary tension or draft on the roving or sliver in the passage thereof to the twisting mechanism, a description of which mechanism will not further be entered into in this specification.

The roving or sliver, indicated at 41, passes from the tension-applying rollers 21, 23 and 24 directly into the twisting head indicated at 31 and the twisted yarn, indicated at 41^a resulting from the operation of the twisting head, passes from the discharge end of said head 31 and is then fed to the winding mechanism at the left-hand end of the construction as illustrated in Fig. 1. This winding mechanism consists of a rotating bobbin-carrying frame rotatively mounted in suitable brackets or standards 63, 63; the frame comprising end members or plates 64 and 65 which are provided with hubs or projections 66 and 67 adapted to be mounted in suitable bushings in the standards or brackets 63; the hub 66 being provided with a pulley 68 which receives the driving belt or member 69 driven by means of suitable stepped pulley indicated at 70 in Fig. 1; the latter being mounted on a cross shaft and may be rotated by means of the belt 71 which, in turn, may be driven off of suitable pulleys mounted on the shaft 61. The pulleys 70 are preferably graduated and made to correspond with the pulleys 60 which receive the belt 59 of the twisting head, so that the bobbin-carrying frame may be driven at substantially the same speed as the twisting head and also driven in the same direction as said head in order to maintain the twist in the yarn given thereto by the twisting mechanism. The end members or arms 64 and 65 are maintained in proper relation with each other by the longitudinal rods 72 which extend through suitable openings in the end members or arms and are clamped in place by means of nuts 73, see Fig. 4.

One end of each end member or transversely disposed arm is enlarged or flared, as more clearly shown in Figs. 7 and 8, so as to provide sufficient space for one or more holding rods 72 as well as two screw-rods 74 and 75; the sustaining rod 72, on this side of the frame, being preferably located intermediate of the screw-rods 74 and 75, see Figs. 3, 7 and 8. One of the screw-rods is provided with a right-hand thread, while the other screw-rod is provided with a left-hand thread, so that the mechanism, later to be described and controlled by said rods, will be caused to move in opposite directions. The hub or extension 66 is provided with an opening preferably in the nature of an arcuate slot shown at 76 in Figs. 4 and 8 intended for the passage of the spun yarn which enters through the hollow hub or extension 66 in its passage from the spinning mechanism to the winding bobbin shown at 77.

The bobbin, which may be of a well known construction and provided with the enlarged cone-shape end shown at 77^a, see Fig. 4, is mounted on a spindle 78, one end whereof is seated in a suitable opening or ferrule 79 formed or secured centrally in the hub-portion of end member or arm 64 at a point concentric with the axis of the carrying frame and the bobbin. The opposite end of the spindle 78 is hingedly secured at 80 to an extension or trunnion 81 which is adapted to pass through the hub 67. The hub 67 is preferably shown counterbored to receive the end of a coil spring 82 which encircles the extension or trunnion 81 and bears against the end portion or head 83 formed on the inner end of extension 81 to provide the pivotal point 80; the spring 82 tending to press the spindle with the bobbin toward the right in Figs. 3 and 4 and thus maintain the opposite end of the spindle 78 in the opening or ferrule 79 at the yarn-receiving end of the winding frame.

The extension 81 of the spindle passes through the hub 67 to the outside thereof to receive a pulley 84, preferably loosely mounted thereon. The pulley 84 receives a belt 85 which extends about a pulley 86 mounted in the lower part of the frame of the machine; the last-mentioned pulley being driven by means of a belt 87, which may, in turn, be driven from proper pulleys mounted on the same shaft as pulley 70. The belts 69 and 85 are arranged to rotate both the carrying frame and the bobbin-spindle in similar directions; the bobbin-spindle, in practice, is rotated at a faster speed than the carrying frame, in order to wind the yarn on the bobbin.

Slidably mounted on the two connecting or tie rods 72 arranged on the same longitudinal side of the carrying frame, is a riding threader or guide comprising the block or member 88; the upper side whereof is provided with an extension or lug adapted to provide a pivotal point at 89 for a straddling member or yoke 90. The member or yoke 90 is provided with an opening for the passage of a screw-rod 91 mounted in the block 88 adjacent one end thereof. The screw-rod or stem 91 is encircled by a suitable coil-spring 92; one end whereof bears down on the block 88 while the other end bears upward against the member 91. The end of the rod or stem 91 above the member 90 is provided with a thumb-nut 93 whereby the extent or degree of action of spring 92 on member 90 is controlled. The member or yoke 90 is provided with a plate

or shoe 94 arranged between the two sides or legs of member 90 and pivotally secured to the member 90 at the point 95, see Figs. 5 and 6, by means of suitable lugs or ears provided on the plate 94. The plate or shoe 94 is preferably bent downwardly toward the bobbin 77, and its forwardly presented end provided with the opposing lugs or hook-portions 96, 96, on the upper surface, as shown in Fig. 5. These hook-portions are adapted to guide the spun yarn 41ª which comes from the discharge end of the spinning mechanism and is passed through the slot 76 of the end member 64 and led lengthwise of the winding frame; the yarn being then passed beneath the rearward extending portion 97 of the shoe and through the opening 98 of the shoe so as to come across the top of the forwardly presented portion and in engagement with one of the hook-portions 96; the yarn in Fig. 5 being shown in engagement with the hook-portion 96 to the right of the shoe because the bobbin 77 is assumed to be rotating in clockwise direction.

The shoe 94 is maintained in proper position relative to the bobbin by means of the coil spring 99 secured to the rear end of the shoe (therefore to one side of the pivotal point 95), while the other end of the spring 99 is secured to the member 90, see Fig. 6. As is apparent, the tendency of the spring will be to draw the rear end of the shoe upward and therefore depress the forward end, provided with the hooks 96, into close relation with the bobbin.

Pivotally mounted in the block or member 88, at a point above the pivotal point 95 of the shoe, are a pair of screw-rod engaging members or arms 100 and 101; the member 100 being presented forwardly in the same direction as the hook or forward end of shoe 94, while the other member 101 is presented rearwardly, namely toward the end of the winding frame at which the yarn 41ª enters the same. Both members 100 and 101 are mounted on a rod 102, which is rotatably mounted in the block 88. One end of the rod 102 is made crank-shape and has the end of a spring 103 secured thereto, while the other end of the spring is secured to the pivot-providing member 89, which is extended out beyond the side of the guiding mechanism so as to permit the spring 103 to exert a direct upward pull on the crank-arm portion of the bar or pin 102. As is more clearly evident from Fig. 6, the pivotal points 89, 95 and 102 are all arranged substantially in the same vertical plane, so that the tendency of spring 103 will be to pull the crank arm 102 to either side of its pivotal or fulcrum point upon the slightest pressure being exerted against the crank arm when the latter has been moved so that spring 103 is pulling against the dead center of the pin or arm 103. The rearward extension 97 of the shoe 94 is provided with a pair of lugs 104 and 105 arranged at predetermined distances apart, see Fig. 6, and adapted to receive the crank arm 102 therebetween, as shown in Figs. 5 and 6. As is evident from this construction, if the hook end or forward portion of shoe 94, in Fig. 6, is elevated by the increasing quantity of yarn on the bobbin, the lug 105 on the rear extension 97 of shoe 94 will be brought into striking engagement with the crank arm 102 and cause the crank arm to be swung toward the left in Fig. 6; and through the action of its spring 103 be moved toward the opposite side of the pivotal point 95 and therefore into close relation with the lug 104.

The ends of the screw-rods 74 and 75 are extended slightly through the end plate 65 of the frame and are each provided with pinions 106 and 107, respectively; the pinions 106 and 107 being suitably secured to the ends of the screw-rods 74 and 75, respectively, so as to rotate therewith. The hub 67 of the frame has bearing in a pinion 108, see Fig. 4, which in turn is secured in the frame 63 and held against rotation. This pinion 108 meshes with both pinions 106 and 107 so that rotation of the frame, by means of the belt 69, which takes about pulley 68 at the opposite end of the frame, will cause the pinions 106 and 107 to move through an orbit about stationary pinion 108 which causes pinions 106 and 107 to rotate and impart rotation to their respective screw-rods 74 and 75.

The free or outer ends of member or arms 100 and 101 are provided with threaded or serrated surfaces correlated to the threads on the respective screw-rod with which each arm is intended to contact; so that the threads of the rods, when the latter are rotated, will induce the winding mechanism to slide or be moved on the rods 72 in the direction of the lead of the threads of the screw-rod which is in operative relation with its respective arm.

The yarn is started on the bobbin 77 at the base of the cone portion 77ª; the composite guide mechanism being moved along the rods 72 into proximity with the base of the cone portion. This necessitates the forward or hook end of the shoe 94 to be elevated and consequently force the rearward extension 97 downwardly, which causes the lug 105 to come into engagement with the crank-arm 102 and force the latter to a point where it will be tripped through the action of its spring 103 and thereby induce arm or member 100 to be moved into operative engagement with its correlated screw-rod; the lead of whose threads are such that the rotation of said rod (induced by the intermeshing pinions heretofore described), will cause the com-

posite guide mechanism to be moved along the rods 72 toward the opposite end of the bobbin. This movement of the composite guide mechanism continues for a short period until the forward or hook-end of the shoe 94 has reached the limit of its lowermost position (the forward end of the shoe being forced downward through the action of its spring 99) at which time the lug 104 will have moved the crank-arm 102 sufficiently to the right in Fig. 6 so that the spring 103 will cause the crank arm to swing into the position shown in Fig. 6, namely toward the right of the pivotal point 95; such movement of the crank-arm will force arm or member 100 out of operative engagement with its correlated screw-rod and cause member or arm 101 to be thrown into operative engagement with its correlated screw-rod, the lead of whose threads is in the opposite direction. This will cause the composite guide mechanism, through rotation of the screw-rod, to travel in the reverse direction along the rods 72, until the forward or hook-end of shoe 94 reaches the limit of its highest or elevated position, namely the position where lug 105 will cause the crank-arm 102 to be tripped in the opposite direction, as previously described.

As is evident from the construction shown and the foregoing description, the maximum high and maximum low points for the forward end of the shoe will constantly be advancing relative to the base portion of the bobbin as the amount of yarn on the bobbin increases, until the opposite or small end of the bobbin has been reached, at which time the bobbin will have been filled with the spun yarn wound in overlapping stages.

The forward end of the shoe is slightly curved upwardly so as to permit the latter to slide freely across the wound yarn during its backward and forward travel in short stages from one end of the bobbin to the other. The forward end of the shoe is provided with the two hook-portions so that yarn may be wound in either direction on the bobbin.

It is apparent that the speed of the bobbin will have to vary and be commensurate with the diameter of the portion at which the yarn is being wound, in order to take up the yarn as it is fed to the winding mechanism. To compensate for the difference in diameter, or, in other words, with the difference in speed necessary to continuously take up the yarn, I loosely mount pulley 84 on the end of the spindle-trunnion or extension 81 and maintain the pulley 84 in frictional contact with a shoulder on the spindle-trunnion or extension 81 by means of spring 109 mounted on the end of the spindle extension beyond the pulley 84 and held in place by suitable nuts 110. The tension of spring 109 may be regulated by the nuts 110 so as to firmly press pulley 84 into frictional engagement with the shoulder of spindle-extension 81, see Fig. 4, and cause the spindle to be rotated through the action of belt 85 which takes about pulley 84. As the yarn, which is being wound on the bobbin, will be held under tension intermediate of the said rolls 42 and 47 of the spinning head and the guide mechanism, it is evident that greater tension or draft will be exerted on the bobbin as the amount of yarn increases thereon and the circumference is being increased, and this increased tension or pull will cause slight slippage between the shoulder on the trunnion 81 of the spindle 78 and the pulley 84, so that the "take-up" of the bobbin will at all times be commensurate with the feed of the spun yarn thereto.

The end of the hub 67, which extends beyond the supporting bracket or standard 63, is shown provided with a suitable collar 112 adapted to prevent longitudinal movement of the hub 67 in the pinion 108.

As is apparent from the construction illustrated in Figs. 4 and 6, the action of the yarn-guide or shoe 94 may be regulated by screwing thumb-nut 93 in the desired direction, which will induce the member 90 to be swung about its pivotal point 89 and thereby move the pivotal point 95 of shoe 94 either toward the right or left and hence affect the moment of tripping by shoe 94 of the crank-rod or rock-shaft on which the oppositely disposed screw-rod engaging members are mounted.

The advantages herein enumerated are obtainable by the construction shown and described, which I believe is the simplest embodiment of my invention; certain modifications may be made, however, without departing from the spirit of my invention.

What I claim is:—

1. In a machine of the class described, winding mechanism comprising a frame rotatably mounted, a bobbin-carrying spindle arranged within the frame along the axial line thereof, means whereby the frame and said spindle are independently rotated, yarn-guiding mechanism arranged to travel in a direction lengthwise of the bobbin, means whereby the yarn-guiding mechanism is made to move lengthwise of the frame when the latter is rotated, and means whereby the direction of travel of said mechanism is controlled through contact of said means with the yarn wound on the bobbin.

2. In a machine of the class described, yarn-winding mechanism comprising a horizontally disposed revoluble frame, a bobbin-carrying spindle revolubly mounted at the axial line of said frame, means whereby the frame and said spindle are independently rotated, yarn-guiding mechanism slidably mounted on the frame and in close relation

with the bobbin, means carried by the frame and in operative relation with said yarn-guiding mechanism whereby the latter is made to travel lengthwise of the frame and alternately in opposite directions, the direction of travel of said yarn-controlling mechanism being controlled by its traveling contact with the yarn wound on the bobbin.

3. In a machine of the class described, yarn-winding mechanism comprising a rectangular frame rotatably mounted, a bobbin-carrying spindle rotatably mounted at the axial line within said frame, means whereby the frame and spindle are rotated, said frame being provided with a pair of screw-rods extending lengthwise of the frame and adapted to be rotated when said frame is revolved, a member slidably mounted on said frame so as to travel lengthwise thereof, yarn-guiding means carried by said member and adapted to alternately engage with said screw-rods, the engaging relation between said means and the screw-rods being determined by the quantity of yarn wound on the bobbin.

4. In a machine of the class described, winding mechanism comprising a revolubly mounted frame, a bobbin-carrying spindle extending lengthwise of the frame and revolubly mounted at the axial line of said frame, a member mounted on said frame so as to move lengthwise thereof, a yarn-guiding shoe pivotally mounted on said member and adapted to have traveling contact with the yarn on the bobbin, means carried by the frame and adapted to be alternately engaged by the selective portions of said member whereby the latter is made to alternately travel in opposite directions lengthwise of the frame, and means for rotating said frame and to actuate said first-mentioned means.

5. In a machine of the class described, winding mechanism comprising a rotatably mounted frame, a bobbin-carrying spindle rotatably mounted in said frame at the axial line thereof, yarn-guiding means slidably mounted on said frame and arranged in traveling contact with the bobbin, rotating means carried by the frame and adapted to have operative relation with said yarn-guiding means, a portion of the yarn-guiding means being adapted to be controlled by its traveling contact with the yarn wound on said bobbin and thereby effect operative relation with the selective portion of the rotating means carried by the frame whereby said yarn-guiding means is made to alternately travel in opposite directions lengthwise of the frame, and means whereby said frame and said rotating means are actuated.

6. In a machine of the class described, winding mechanism comprising an elongated frame adapted to rotate, a bobbin-carrying spindle rotatably mounted in said frame, means whereby the frame and said spindle are independently rotated, a pair of screw rods extending lengthwise of the frame and adapted to be rotated through the rotation of said frame, guiding means slidably mounted on said frame and adapted to be alternately brought into engagement with said screw-rods, and means adapted to be controlled by the quantity of yarn wound on the bobbin whereby the operative relation with the selective screw-rod is controlled.

7. In a machine of the class described, winding mechanism comprising a horizontally disposed elongated frame revolubly mounted and adapted to receive the yarn through one end thereof, a bobbin-carrying spindle rotatably mounted in said frame, means whereby the frame and said spindle are independently operated, a member slidably mounted on the frame so as to move lengthwise thereof, a pivotally mounted guide carried by said member and adapted to be in traveling contact with the bobbin, rotating means carried by the frame adapted to be operated by rotation of said frame, and means intermediate of said guide and said rotating means adapted to alternately have operative engagement with selective portions of the rotating means whereby said member and guide are made to alternately travel in opposite directions along said frame.

8. In a machine of the class described, winding mechanism comprising a frame provided with hollow trunnions at opposite ends thereof whereby said frame is rotatably mounted, a bobbin-carrying spindle rotatably mounted in said trunnions, means whereby the frame and said spindle are independently rotated, a pair of rotatably mounted screw-rods extending lengthwise of the frame, means intermediate of the frame and said screw-rods whereby the latter are rotated when said frame is revolved, yarn guiding means mounted on said frame so as to move lengthwise thereof, and means carried by said yarn-guiding means and arranged in traveling contact with the bobbin, said last means being adapted to alternately be moved into operative engagement with said screw-rods through its traveling contact with the yarn on the bobbin whereby said yarn guiding means is made to travel back and forth upon said frame.

9. In a machine of the class described, winding mechanism comprising an elongated frame provided with hollow trunnions whereby the frame is revolubly mounted, a bobbin-carrying spindle rotatably mounted in said trunnions, means whereby the frame and said spindle are independently rotated, a traveling member carried by said frame, a guiding member pivotally mounted on said traveling member and arranged to have traveling contact with the bobbin, a pair of

spring-controlled contacting members arranged on said traveling member and adapted to be actuated by said guiding member, and rotating means adapted to be engaged alternately by each of said contacting members.

10. In a machine of the class described, winding mechanism comprising an elongated revolubly mounted frame provided with a pair of screw-rods, the leads of whose threads extend in opposite directions, means whereby said rods are rotated when said frame is revolved, a bobbin-carrying spindle rotatably mounted in said frame, means whereby the frame and the bobbin-spindle are independently rotated, guiding means adapted to travel lengthwise of the frame, a member pivotally mounted on the guiding means and arranged in traveling contact with the yarn wound on said bobbin, and screw-rod engaging means, different portions whereof are alternately brought into operative engagement with different screw-rods and the guiding means made to travel back and forth along said frame.

11. In a machine of the class described, winding mechanism comprising an elongated rotatably mounted frame provided with a pair of screw-rods having oppositely disposed threads and rotatably mounted in said frame, means whereby the screw-rods are rotated when said frame is revolved, a member slidably mounted on said frame so as to move lengthwise thereof, a guide-member pivotally mounted on said last-mentioned member, and means pivotally mounted intermediate of said guide-member and said screw-rods adapted to be moved into operative relation with the latter when the means is tilted on its pivotal point whereby the direction of travel of said member is reversed.

12. In a machine of the class described, winding mechanism comprising a rotatably mounted frame provided with rotatably mounted means, a member slidably mounted on said frame, a yarn-guiding shoe pivotally mounted on said member, means controlled by the shoe and adapted to alternately be moved through the action of said shoe into operative engagement with selective portions of said rotatably mounted means to traverse said member back and forth, a bobbin-carrying spindle rotatably mounted in said frame and adapted to be independently rotated.

13. In a machine of the class described, winding mechanism comprising a rotatably mounted frame, a bobbin-carrying spindle rotatably mounted in said frame, means adapted to travel lengthwise of the frame, spring-controlled mechanism carried by said means and adapted to be actuated by the quantity of material wound on said bobbin, and rotating means, selective portions whereof are adapted to be engaged by said spring-controlled mechanism.

14. In a machine of the class described, winding mechanism comprising a rotatably mounted frame provided with a pair of screw-rods having oppositely disposed threads, means whereby said screw-rods are rotated when said frame revolves, a bobbin-carrying spindle rotatably mounted in said frame, a member slidably mounted on said frame adapted to travel lengthwise of the screw-rods, a yoke pivotally mounted on said member, a yarn or thread-guiding member pivotally mounted at the lower end of said yoke and adapted to have traveling contact with the bobbin, and a pair of members pivotally mounted on said first-mentioned member adapted to alternately have operative engagement with said screw-rods whereby the direction of travel of the first-mentioned member is controlled.

15. In a machine of the class described, winding mechanism comprising an elongated rotatable frame provided with hollow trunnions at the ends thereof, a bobbin-carrying spindle rotatably mounted in one of said trunnions, while the other trunnion is adapted for the passage of the yarn or thread to be wound, means whereby the frame and spindle are independently rotated, means mounted on the frame and adapted to travel in a direction lengthwise of the bobbin-spindle, means intermediate of said second means and a trunnion of the frame whereby movement to said second means will be imparted when said frame rotates, and a yarn or thread guide-member carried by said second means and in traveling contact with the bobbin on said spindle, said member being adapted to be controlled by the quantity of yarn or thread wound on the bobbin at successive points and thereby cause selective portions of said second mentioned means to have operative engagement with the third mentioned means whereby the movement of the second means with the guide-member is controlled.

16. In a machine of the class described, winding mechanism comprising a rotatably mounted frame, guiding means mounted on the frame and adapted to travel lengthwise thereof, means intermediate of the axis of the frame and said guiding means whereby movement to the latter is imparted through rotation of the frame, a bobbin rotatably mounted in said frame, and tripper mechanism carried by said guiding-means adapted to be actuated by the quantity of material wound on the bobbin, whereby selective portions of said second-mentioned means are brought into operative engagement with the guiding means and the direction of movement of the latter controlled.

17. In a machine of the class described, winding mechanism comprising an elongated

rotatably mounted frame, a bobbin-carrying spindle rotatably mounted in said frame and independently operable, a member slidable on said frame, a yarn-guide carried by said member and adapted to be actuated by the yarn wound on the bobbin, rotating means carried by the frame and extending lengthwise of the path of travel of said slidable member, and a rock-shaft provided with oppositely disposed portions adapted to engage with different portions of said rotating means, said rock-shaft being arranged to be controlled by said yarn-guide whereby selective portions of said rotating means and the oppositely disposed portions of the rock-shaft are brought into operative engagement and the direction of travel of said member and yarn-guide is controlled.

18. Winding mechanism, comprising a rotatably mounted frame, a pair of oppositely threaded screw-rods, means whereby said rods are rotated through rotation of the frame, a bobbin-carrying spindle rotatably mounted in the frame, yarn-guiding means slidably mounted on the frame and having a spring-controlled portion held in yielding contact with the bobbin on the spindle, and oscillatingly mounted means carried by said guiding means adapted to be oscillated through movement of the spring-controlled portion of said guiding means so as to alternately engage with each screw-rod and thereby cause the guiding means to have back and forth movement during its travel from one end of the frame to the other.

19. Winding mechanism, comprising a rotatably mounted frame, a pair of oppositely threaded screw-rods rotatably mounted in the frame, means whereby said rods are rotated through rotation of said frame, a bobbin-carrying spindle rotatably mounted in the frame, yarn-guiding means slidably mounted on the frame and in yielding contact with the bobbin, means whereby the yielding contact of said guiding means may be regulated, and oscillatingly mounted means, carried by the guiding means, adapted to be oscillated through the movement of said guiding means so as to alternately engage with each screw-rod and thereby cause the guiding means to have back and forth movement during its travel from one end of the frame to the other.

20. Winding mechanism, comprising a rotatably mounted frame, a pair of oppositely threaded screw-rods, means whereby said rods are rotated through the rotation of said frame, a bobbin-carrying spindle rotatably mounted in the frame, means adapted to travel lengthwise of the frame, a spring-controlled yarn-guiding shoe pivotally mounted on said means and held in yielding contact with the bobbin, a pair of arms pivotally mounted on said means so as to have one arm engage with each screw-rod at different intervals, and means intermediate of said shoe and the arms whereby movement of the shoe will cause the selective arm to be moved into engagement with its respective screw-rod and thereby control the direction of travel of said first means.

21. Winding mechanism, comprising an elongated frame, a pair of oppositely threaded screw-rods, means whereby said rods are rotated, a bobbin-carrying spindle rotatably mounted in the frame, means adapted to travel lengthwise of the frame, a spring-controlled yarn-guiding shoe pivotally mounted on said means and in yielding contact with the bobbin, means whereby the contact of said shoe may be regulated, a pair of pivotally mounted arms carried by said means so as to have one arm engage with each screw-rod at different intervals, and means intermediate of said shoe and the arms whereby movement of the shoe will force the selective arm into engagement with its respective screw-rod and cause said first means to have back and forth movement during its travel from one end of the frame to the other.

22. Winding mechanism, comprising an elongated frame, a pair of rotating elements mounted in the frame, a bobbin-carrying spindle rotatably mounted in said frame, means adapted to travel lengthwise of the frame, spring-controlled mechanism carried by said means and adapted to be alternately brought into engagement with each of said elements, and a trip member pivotally mounted on said means adapted to be actuated by the quantity of material wound on the bobbin and arranged to control said spring-controlled mechanism.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."