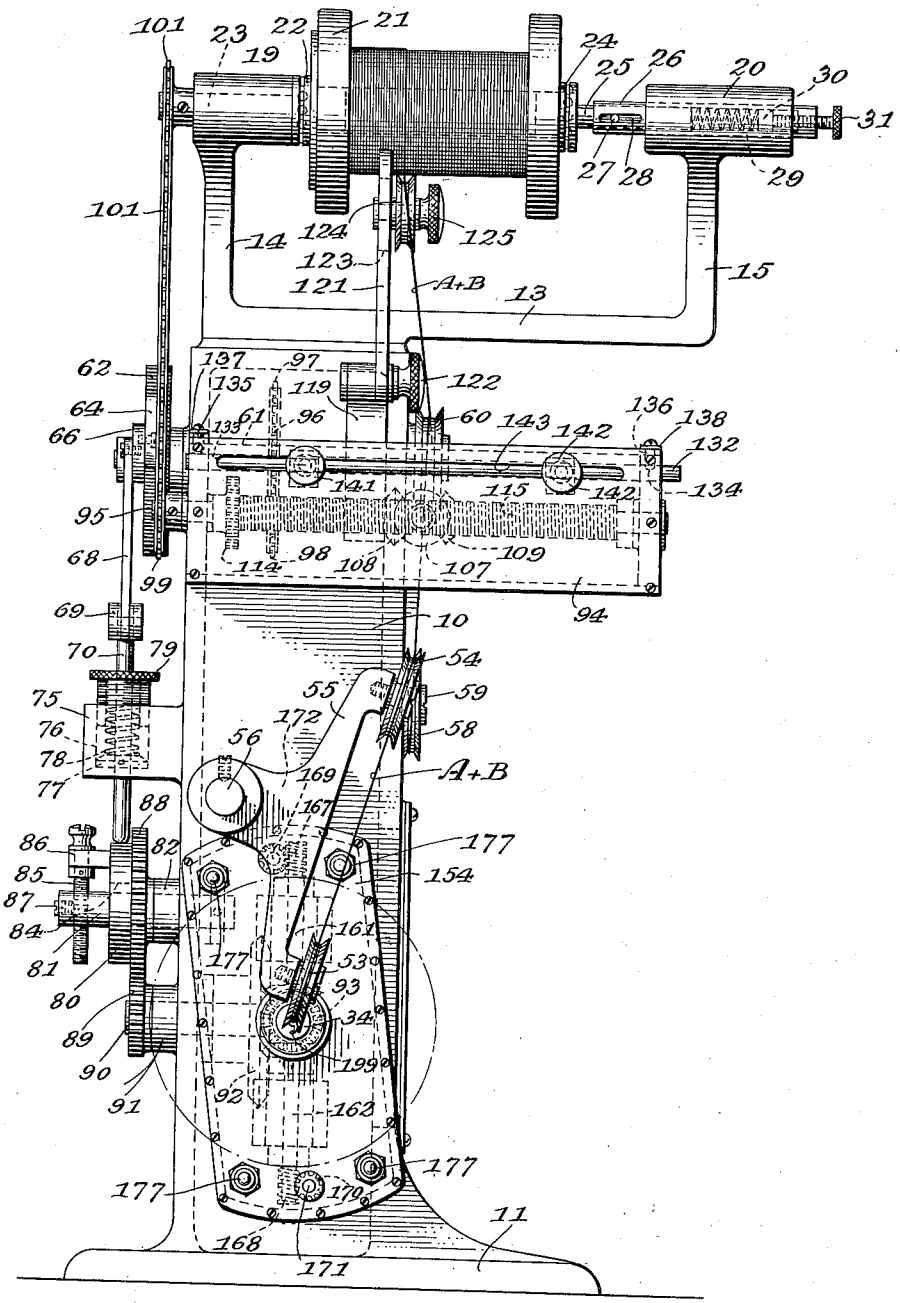
Feb. 1, 1927. 1,616,068

A. J. TRENCK

WIRE COVERING MACHINE

Filed Aug. 14, 1925 4 Sheets-Sheet 1

Fig. 1



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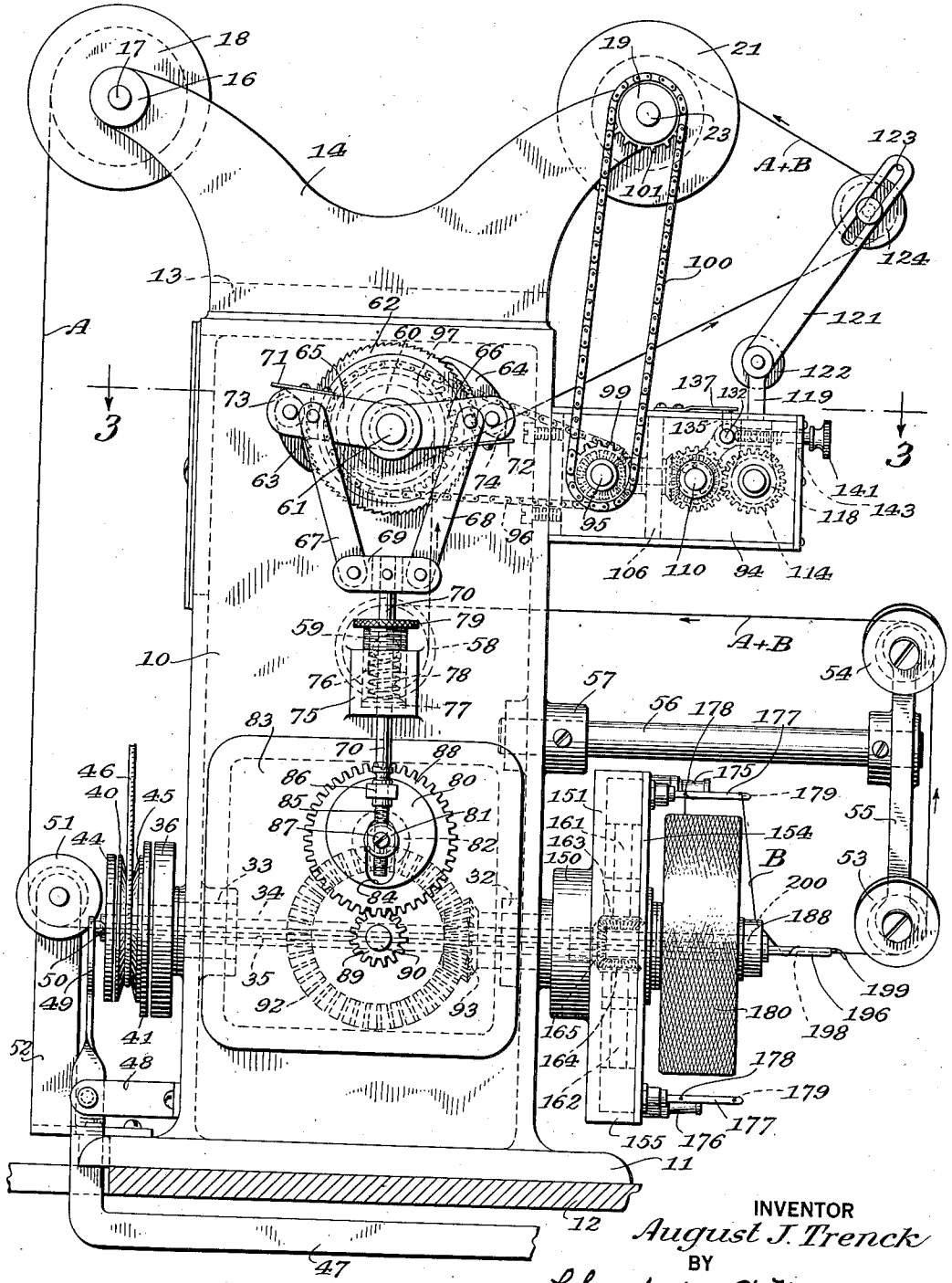
1,616,068

WIRE COVERING MACHINE

Filed Aug. 14, 1925

4 Sheets-Sheet 2

Fig. 2



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WIRE COVERING MACHINE

Filed Aug. 14, 1925 4 Sheets-Sheet 3

Fig. 3

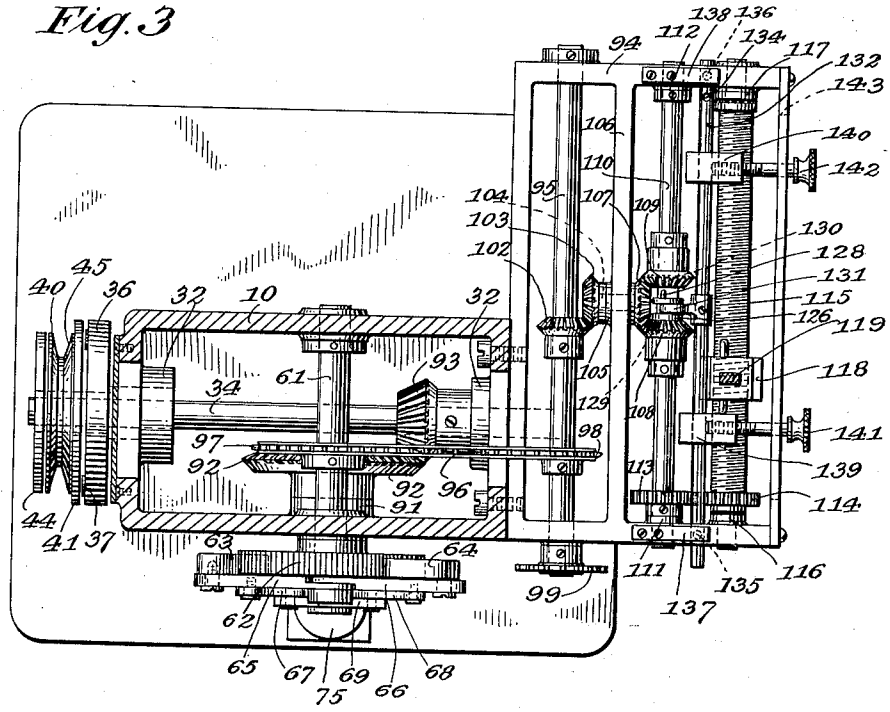


Fig. 4

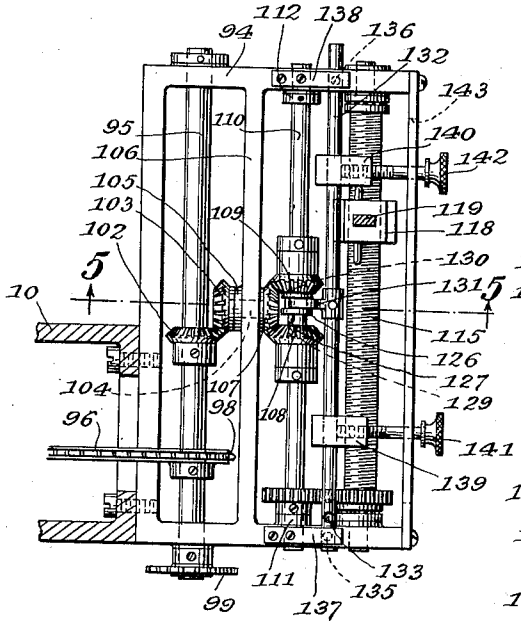
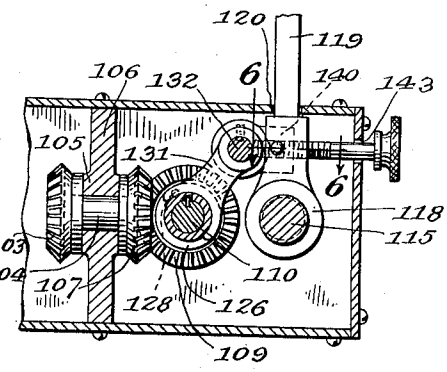


Fig. 5



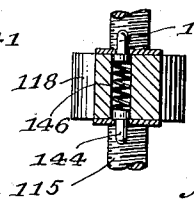


Fig. 6

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WIRE COVERING MACHINE

Filed Aug. 14, 1925 4 Sheets-Sheet 4

Fig. 7

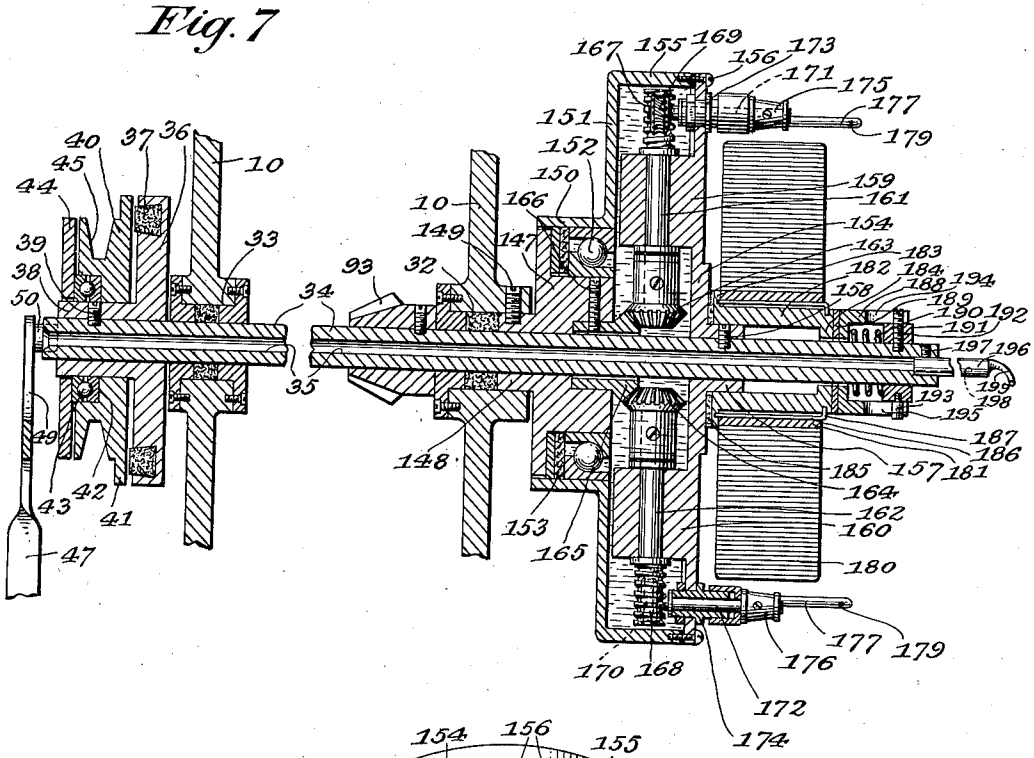
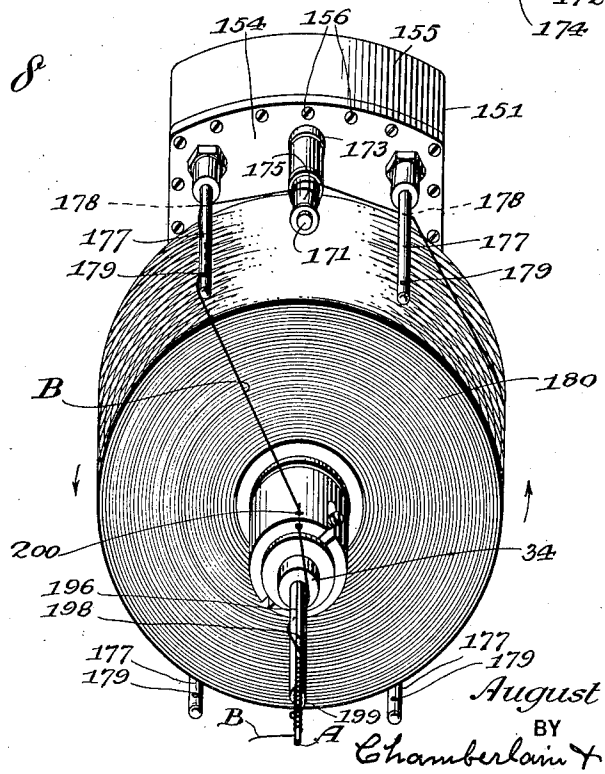


Fig. 8



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Patented Feb. 1, 1927. 1,616,068

UNITED STATES PATENT OFFICE.

AUGUST J. TRENCK, OF MILFORD, CONNECTICUT.

WIRE-COVERING MACHINE.

Application filed August 14, 1925. Serial No. 50,242.

The present invention relates to a machine for covering wire, and particularly a machine for continuously and automatically winding a covering of cotton or silk yarn about a wire to provide an insulation or other covering, an object of the invention being to provide a machine which may be operated with great rapidity, and which will produce a wound covering of uniform winding and tightness.

A further object is to provide feed means for positively feeding the yarn or silk and wire in synchronism, and co-operating in such manner that the yarn may be wound with great speed without uneven pulling and breakage. To this end it is particularly proposed to provide a rapidly rotatable flier for the cop of winding yarn and including positively driven feed means for reeling off the yarn as it is wound in such manner that the feed of the yarn off the cop will synchronize with the winding.

A further object is to provide improved means for varying the feed of the wire and yarn to accommodate different gauged wires and different thicknesses of yarn.

A further object is to provide an improved take-up bobbin means for receiving the wound wire, and traversing means for laying the same evenly thereon, and which will be automatically driven in synchronism with the winding mechanism.

A still further object is to provide a machine which may be driven to wind the yarn in opposite directions upon the wire, without the use of substituted or additional parts, so that the wound wire may be refed through the machine for the winding of additional covering layers, these successive layers being wound in opposite directions.

With the above and other objects in view an embodiment of the invention is shown in the accompanying drawings and this embodiment will be hereinafter more fully described with reference thereto, and the invention will be finally pointed out in the claims.

In the drawings:—

Fig. 1 is a front elevation of a wire covering machine according to the present embodiment of the invention;

Fig. 2 is a side elevation thereof;

Fig. 3 is a horizontal sectional view taken along the line 3—3 of Fig. 2 and showing particularly the wire feed and traversing mechanism, the driving means for the traversing means being in position to drive in one direction;

Fig. 4 is a similar view of the traversing mechanism in position to drive in the other direction;

Fig. 5 is an enlarged vertical sectional view through the traversing mechanism and taken along line 5—5 of Fig. 4;

Fig. 6 is a detail sectional view of a portion of the traversing mechanism taken along the line 6—6 of Fig. 5;

Fig. 7 is an enlarged sectional view of the flier shaft for winding the yarn about the wire, and

Fig. 8 is a perspective view of the flier and showing the yarn cop thereon.

Similar reference characters indicate corresponding parts throughout the several figures of the drawings.

Referring to the drawings the machine according to the present embodiment of the invention comprises a frame in the form of a hollow vertical stand 10 of rectangular cross section having a laterally extended base 11 secured upon a suitable supporting table 12. Upon the upper end of the stand 10 there is mounted a bracket frame 13 projecting at one side of the stand and having vertical end standards 14 and 15 projected forwardly and rearwardly, the rearward projecting portions being provided with bearings 16 for the supporting shaft 17 of the spool or bobbin 18 containing wire to be wound, and the forwardly projecting portions being provided respectively with bearings 19 and 20, between which the spool or bobbin 21 for receiving the wound wire is supported at one end by the ball-bearinged head 22 of a positively driven shaft 23, journaled in the bearing 19, and at the other end by the ball-bearinged head 24 of a plunger shaft 25, guided for longitudinal movement in a sleeve 26 mounted in the bearing 20 by a pin 27 on said shaft engaging a slot 28 of the sleeve, and yieldably pressed toward the spool by a spring 29 interposed between the end of the shaft 25 and a block member 30 adjustable inwardly and outwardly by means of a set screw 31 in the end of the sleeve. This construction permits of the convenient mounting and removal of the spools.

The supports for the spool 18 containing the wire to be wound may preferably be of

similar construction to those of the spool 21 so that the spools may be interchangeably mounted, the shaft 17 not being positively driven however.

In the lower portion of the stand 10 and in suitable bearing portions 32 and 33 in the front and rear walls thereof, there is journaled the horizontal flier shaft 34 having a wire feeding passage 35 therethrough, and upon the rearwardly projecting end of said shaft adjacent the bearing 33 there is provided a clutch disc 36 having suitable inserts 37 of cork, or the like, and having its rearwardly extending hub 38 secured to the shaft by a screw 39. Upon said hub there is slidably mounted a pulley 40 having a flange 41 at its side adjacent the disc 36 adapted to frictionally engage the inserts 37, and provided at its other side with an annular recess 42 in which there is engaged a ball bearing unit 43 secured at one side to the pulley and at its other side to a disc 44 surrounding the end of the hub 38. The pulley is provided with a V-groove 45 in which is engaged a drive belt 46 extending from a suitable motor or other driving element (not shown), the pulley being normally shifted outwardly on the hub 28 so as to run freely with respect to the clutch while the machine is inoperative and adapted to be pressed into engagement with the clutch to thereby rotate the flier shaft by means of a lever 47, pivotally mounted in a bracket 48 secured to the stand 10, and extended beneath the table 12 to a convenient point at the front of the machine for manipulation by the operator; being provided at its operative end with a yoke 49 disposed at each side of the end of the flier shaft and provided with contact bosses 50 engaging the disc 44, and adapted upon depression of the lever by the operator to press the pulley into frictional engagement with the clutch.

The yarn feeding flier, hereinafter more fully described, is mounted on the forwardly projecting end of the shaft 34 and is adapted by rotation about the wire A being fed to wind the yarn B about it as a covering, the wire being guided from the spool 18 to the passage 35 through the flier shaft over a sheave 51, rotatably mounted on the bracket 52 secured to the base 11, and the wound wire being guided from the forward end of the flier shaft to the take-up spool 21, first over sheaves 53 and 54, rotatably mounted on the ends of an arm 55 adjustably supported on a post 56 secured in a suitable boss 57 of the stand 10, and then over positively driven feeding and traversing mechanism, presently to be described.

The wound wire is carried from the sheave 54 about a sheave 58, loosely mounted on a stud 59 secured in one side of the stand 10, and from said sheave 58 upwardly about a positively driven feed sheave 60, secured upon one end of a shaft 61 journaled in suitable bearings in the opposed side walls of the stand 10, and provided upon its other end with a ratchet wheel 62, engaged by oppositely disposed alternately operative pawls 63 and 64, pivotally carried upon the ends of lever arms 65 and 66 rotatably supported upon the end of the shaft 61 and pivotally connected by links 67 and 68 to the cross head 69 of a vertically reciprocating plunger shaft 70. The pawls are yieldably engaged with the ratchet by means of leaf-springs 71 and 72 secured to the arms 65 and 66 and engaging lug extensions 73 and 74 of the pawl. The plunger shaft 70 is slidable in a vertically passaged guide fixture 75 having a threaded pocket 76 therein, in which there is disposed a collar 77 fixed to the shaft and a spring 78 interposed between said collar and an adjustable apertured cap nut 79 screwed into the pocket, said spring adapted to press the lower end of the shaft into engagement with an eccentric cam 80, adjustably mounted on the end of a stud shaft 81 journaled in a suitable bearing 82 provided in a cover plate 83 secured to one of the side walls of the stand 10, the adjustment means of said cam consisting of a slot 84 therein engaging the shaft and a screw 85 threadably engaged in the shaft and rotatably supported at one end in a bearing 86 fixed to the face of the cam, the turning of the screw 85 adapted to adjust the degree of eccentricity of the cam upon the shaft, a set screw 87 adapted to fix the adjusted position of the screw. A gear 88 is mounted on the shaft 81 and meshes with a pinion 89 provided upon the outer end of a shaft 90, journaled in a suitable bearing 91, provided at its inner end with a beveled gear 92 meshing with a beveled pinion 93 secured upon the flier shaft 34.

The operation of the wire feeding mechanism is as follows:—

As the flier shaft is rotated the cam 80 is rotated through the gearing 93, 92, 89 and 88 and causes the shaft 70 to be vertically reciprocated, the upward stroke causing the lever arms 65 and 66 to be swung upwardly so that the pawl 64 engages the teeth of the ratchet to impart rotary movement thereto, the pawl 93 at the same time riding in opposed direction over the teeth, the downward stroke swinging the levers downwardly causing the pawl 63 to engage the teeth and the pawl 64 to ride free, so that a continuous rotation is imparted to the ratchet and sheave 60 to feed the wire, such feeding being in synchronism with the winding movement of the flyer shaft. By adjusting the eccentric cam the extent of the stroke and the relative feed with respect to the speed of the flyer shaft may be regulated as desired. The mechanism is furthermore such that the continuous rotary movement

imparted to the ratchet will always be in the same direction irrespective of the direction in which the flyer shaft is driven, thereby permitting reverse operation of the flier shaft without interfering with the normal operation of the feeding means, and as will hereinafter more fully appear.

As the wire passes from the sheave 60 to the take-up spool 21 it is carried over a traversing mechanism, which consists of a supporting frame 94 secured upon the front wall of the stand 10 near its upper end, in which there is journaled a horizontal shaft 95 adapted to be driven from the shaft 61 by a sprocket chain 96 engaging pinions 97 and 98 respectively provided on the shafts 61 and 95.

The shaft 95 in addition to driving the traversing mechanism also drives the take-up spool shaft 23, and for this purpose a sprocket gear 99 is provided on the end of said shaft 95 and is connected by a sprocket chain 100 to the gear 101 provided upon the end of said shaft 23.

A beveled pinion 102 is secured upon the shaft 95 and meshes with a beveled pinion 103 provided upon one end of a shaft 104, journaled in a bearing 105 of a partition wall 106 within the frame 94, said shaft being provided at its other end with a beveled pinion 107 meshing at diametrically opposite points with spaced beveled pinions 108 and 109 loosely mounted upon a shaft 110, journaled at its ends in bearings 111 and 112 in the end walls of the frame 94, the pinions 108 and 109 adapted to be driven in opposed directions.

Upon one end of the shaft 110 there is secured a gear 113 meshing with a gear 114, provided at one end of a screw shafrt 115 journaled in bearings 116 and 117 in the end of the frame, and upon which there is engaged a nut 118 having a vertical extension 119 projected upwardly through a guide slot 120 in the top of the frame, and to the upper end of which an arm 121 is mounted for pivotal adjustment by means of a set screw 122, the upper end of said arm being slotted as at 123 and having a sheave 124 adjustably secured therein by a set screw 125, and over which sheave the wound wire passes from the feeding mechanism to the take-up spool. The screw 115 is adapted during the operation of the machine to be driven first in one direction and then in the other, whereby the nut 118 and the sheave 124 carried thereby are reciprocated back and forth with respect to the take-up spool 21 to lay the wound wire evenly thereon. For this purpose an annularly grooved clutch collar 126 is slidably keyed upon the shaft 110 between the oppcsitely rotating gears 108 and 109, and is provided at each side with projecting pins 127 and 128 adapted as the collar is shifted in one or the other directions to be respectively engaged in the pockets 129 and 130 in the opposed faces of said gears 108 and 109, the shaft 110 and the screw 115 being rotated in one direction during connection of the clutch with the gear 108 and in the other direction during the connection of the gear 109. The yoke arm 131 is engaged at its forked end in the annular groove of the clutch collar and has its hub end secured upon a horizontal shift rod 132, slidably mounted at its ends in suitable guide passages in the end walls of the frame, and provided adjacent its ends with recesses 133 and 134 adapted to be respectively engaged by plunger pins 135 and 136 pressed toward the rod by leaf springs 137 and 138 secured to the end walls of the frame, to thereby yieldably retain the rod in either of its shifted positions. Stop lugs 139 and 140 are adjustably secured upon the rod near its ends by means of elongated set screws 141 and 142 extended through a slot 143 in the front wall of the frame, and are adapted to be engaged by spring pressed plunger pins 144 and 145 projecting at each side of the nut 118 to shift the rod as the nut completes its traverse in one or the other directions. The spring 146 acting upon the plunger is of sufficient strength to disengage the plunger pins 135 and 136 from the recesses 133 and 134, and after such disengagement yieldably presses the clutch collar toward the gears 108 and 109, as the case may be, until the pin 127 or 128 on the clutch collar drops into the pockets 129 or 130 of the gear, the spring 146 thereupon pressing the rod to its completely shifted position where it is yieldably held by one of the plungers 135 and 136.

The yarn winding flier comprises a stationary bearing 147 surrounding the flier shaft and having a reduced hub portion 148 secured by a set screw 149 in the bearing 32 and about which a circular flange 150 of the flier casing 151 is rotatably mounted upon ball bearings 152, a packing ring 153 adapted to seal the interior of the casing. The casing 151 is of elongated shape, the end walls being circumferential to the axis, and the side walls being parallel to each other. A cover plate 154 is secured upon the peripheral flange 155 of the casing by means of screws 156, and is provided with a central forwardly projecting hub 157 secured to the flier shaft 34 by a set screw 158. The cover plate is provided at its inner side, and in diametrically opposed relation, with bearing bosses in which aligned shafts 161 and 162 are journaled, the axis of these shafts being diametrically disposed in the casing. The shafts are provided at their inner ends with beveled gears 163 and 164 which mesh with a stationary gear 165, secured in the bearing 147 by means of a set screw 166, and are provided at their outer ends with

spiral worms 167 and 168 which mesh with spiral worm gears 169 and 170 provided upon the inner ends of the spindle shafts 171 and 172, rotatably mounted in bearings 173 and 174 secured in the cover plate in diametrically aligned relation, and having tapered end shouldered rollers 175 and 176 secured at their outer ends. At the four corners of the flier, and at each side of the rotary spindles 171 and 172, there are secured projecting yarn guiding posts 177 provided adjacent their inner and outer ends with yarn guiding holes or eyelets 178 and 179 disposed at right angles to each other, the inner holes being substantially horizontal in the position of the flier as shown in Fig. 8.

The yarn cop 180 having a central tubular bushing 181 is mounted upon a sleeve 182 flanged outwardly at its inner end at 183 and inwardly at its outer end as at 184 and slidably engaged upon the hub 157 against a compressible sealing gasket 185, the cop being frictionally held upon the sleeve by means of spring bands 186 secured at their inner ends in the flange 183 and at their outer right-angularly-bent ends 187 to the cylindrical surface of the sleeve adjacent its outer end. The sleeve is secured in place by means of a cup-shaped centrally apertured member 188, pressed against a friction washer 189 interposed between it and the end of the sleeve by means of a spring 190 disposed between the inner end of said member and a collar 191 secured upon the end of a flier shaft by means of a set screw 192, the projecting outer end of this set screw and an opposed stud 193 secured in the collar being engaged in slots 194 and 195 formed in the member to provide a driving connection between the shaft and said member. It will be noted that while there is a positive driving connection between the flier shaft and the member 188 the mounting of yarn cop is frictional, so that a relative rotation of the cop about the rotating flier is permitted. In the end of the flier shaft 34 there is inserted a yarn guide 196, secured by a set screw 197, provided with a longitudinal groove 198, and having a curled hook portion 199 at its outer end disposed at one side of the groove and partially curled about the emerging wire. The hollow flier casing is filled with a suitable lubricant, as shown, for lubricating the gearing, and which is prevented from creepage to the yarn cop by the gasket 185.

The yarn from the cop is carried first through the eyelet hole 178 (Fig. 8) of one of the posts 177, is then wound about the roller 175 of the rotating spindle 171, passed through the eyelet hole 178 of the opposed post 177 and upwardly through the eyelet hole 179 thereof, and then through a diagonal hole 200 in the member 188, from which it is wound about the guide 196, and then carried through the groove 198 where it is wound about the wire.

The operation of the flier is as follows:—

The winding being in counter-clockwise direction, as shown in Fig. 8, and the machine set in operation, the wire A is slowly fed through the flier shaft, being wound from the spool 18 and upon the spool 21 and the rapidly rotating flier winds the yarn about the wire as a covering. During the winding the yarn is positively reeled off the cop by rotation of the spindle 171, the cop having relative rotary movement with respect to the rotary movement of the flier by reason of the frictional mounting. The speed of the reeling off of the yarn is calculated as slightly in excess of the winding of the yarn upon the wire, this excess being taken up by the frictional mounting of the cop, so that the danger of uneven pull and breakage of the yarn is minimized, and an even feed to the wire is provided. The curled hook portion 199 embraces the emerging wound wire in a manner to insure against overlapping of the winding.

In order to wind the yarn in clockwise direction, the direction of rotation of the flier is reversed by merely changing the direction of the drive belt 46, as by twisting it, the yarn cop being mounted so that its yarn is carried up from the left, as distinguished from the right as shown in Fig. 8, the yarn being threaded down to the wire in opposed relation to that as shown. A guide member 198 having an oppositely curled hook portion 199 is preferably substituted. The feeding mechanism for the wire is such as to operate in the same direction, irrespective of the direction of the flier shaft. This feature of reverse winding is especially desirable in the production of wire having a plurality of covering layers, the successive layers being reversely wound. In practice a previously wound coil of wire may be mounted at the feeding side (spool 18), and fed through the machine operating in reverse direction so that a covering wound reversely to the previous covering is wound thereon.

It will be understood that various gauges of yarn and wire may be employed in the machine, the feed of the yarn with respect to various gauges of wire being regulated by changing the feed roller 175 to provide different diameters, and the feed of the wire with respect to various gauges of yarn being regulated by adjustment of the cam 80.

The provision of the symmetrically arranged driving spindles 171 and 172 and the posts 177 at each end of the flier casing permit either spindle to be employed for either forward or reverse winding, and at the same time provide a symmetrically disposed and balanced simultaneously moving structure at each side of the axis, so that the flier will

be free of vibration at the very rapid speed at which it is driven.

I have illustrated and described a preferred and satisfactory embodiment of the invention, but it will be obvious that changes may be made therein within the spirit and scope thereof, as defined in the appended claims.

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

1. In a wire covering machine, a tubular rotary flier shaft adapted to be rotated in one or the other directions, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a yarn cop carrying flier on said shaft, feed means for said wire adapted to engage the same between said shaft and said receiving means, and unidirectional driving means between said shaft and said feed means adapted to transmit movement to the latter.

2. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said wire receiving means, through said shaft, a yarn cop carrying flier on said shaft, feed means for said wire adapted to engage the same between said shaft and said receiving means, and drive means between said shaft and feed means adapted to transmit movement to the latter in one direction upon rotary movement of said shaft in one or the other directions.

3. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said wire supply means to said receiving means through said shaft, a yarn cop carrying flier on said shaft, feed means for said wire adapted to engage the same between said shaft and said receiving means, drive means between said shaft and said feed means adapted to transmit movement to the latter, and means for adjusting the effective feeding movement of said feed means independently of the movement of said flier shaft.

4. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said feeding means, a yarn cop carrying flier on said shaft, feed means for the wire adapted to engage the same between said shaft and receiving means, driving means between said shaft and said feed means adapted to transmit movement to the latter in one direction upon rotary movement of said shaft in one or the other directions, and traversing means operatively connected to said feed means and adapted to guide the wire upon said receiving means.

5. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a yarn cop carrying flier on said shaft, feed means on said flier adapted to engage the same between said shaft and said receiving means and including a rotary sheave, reciprocating means to drive said sheave continuously in one direction, and means on said flier shaft for imparting movement to said reciprocatory means.

6. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a yarn cop carrying flier on said shaft, feed means for said wire adapted to engage the same between said shaft and said receiving means and including a rotary sheave, reciprocating means adapted to drive said sheave continuously in one direction, a rotary cam for imparting movement to said reciprocatory means, and gearing between said shaft and cam adapted to impart movement to the latter.

7. In a wire covering machine, a tubular rotary flier shaft, means for rotating said shaft in forward or reverse directions, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a yarn cop carrying flier on said shaft, feed means for said wire adapted to engage the same between said shaft and said receiving means and including a rotary sheave, reciprocating means adapted to drive said sheave continuously in one direction, a rotary cam for imparting movement to said reciprocatory means, and gearing between said flier shaft and cam adapted to impart movement to the latter, said feed means operating in the same direction, irrespective of the direction of rotation of said flier shaft.

8. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a yarn cop carrying flier on said shaft, feed means for said wire adapted to engage the same between said flier and said receiving means and including a rotary sheave, a ratchet secured to said sheave, pawls engaging said ratchet in opposed relation, means for simultaneously moving said pawls in clockwise and counter-clockwise direction whereby said ratchet is continuously rotated in one direction, and means between said shaft and said last means for operating the latter.

9. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move

from said supply means to said receiving means through said shaft, a yarn cop carrying flier on said shaft, feed means for said wire adapted to engage the same between said flier and said receiving means and including a rotary sheave, a ratchet secured to said sheave, pawls engaging said ratchet in opposed relation, reciprocating means for simultaneously moving said pawls alternately in clockwise and counter-clockwise direction whereby said ratchet is continuously rotated in one direction, and means between said shaft and said last means for operating the latter.

10. In a wire covering machine, a tubular rotary flier shaft a pulley on said shaft, belt means adapted by twisting to rotate said shaft in forward and reverse directions, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a yarn cop carrying flier on said shaft, feed means for said wire adapted to engage the same between said flier and said receiving means, and drive means between said shaft and feeding means adapted to transmit movement to the latter in one direction upon rotary movement of said shaft in one or the other directions.

11. In a wire covering machine, a tubular rotary flier shaft adapted to be rotated in one or the other directions, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a flier carried by said shaft comprising a flier head rotatable with said shaft, a yarn cop holder for frictionally supporting a yarn cop, an unreeling spindle carried by said head, a yarn guide at the end of said shaft, yarn guides carried by said head at each side of said spindle adapted for threading in either direction of rotation of the shaft, and means actuated by the rotation of said head to impart relative rotation to said spindle.

12. In a wire covering machine, a tubular rotary flier shaft adapted to be rotated in one or the other directions, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a flier carried by said shaft comprising a flier head rotatable with said shaft, a yarn cop holder for frictionally supporting a yarn cop, unreeling means disposed symmetrically in opposed relation at diametrically opposite sides of said shaft, and means actuated by the rotation of said head to impart relative rotation to said spindle.

13. In a wire covering machine, a tubular rotary flier shaft adapted to be rotated in one or the other directions, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a flier carried by said shaft comprising a flier head rotatable with said shaft, a yarn cop holder for frictionally supporting a yarn cop, unreeling spindles disposed symmetrically in opposed relation at diametrically opposite sides of said shaft, and means actuated by the rotation of said head to impart simultaneous relative rotation to said spindles.

14. In a wire covering machine, a tubular rotary flier shaft adapted to be rotated in one or the other directions, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a flier carried by said shaft comprising a flier head rotatable with said shaft, a yarn cop holder for frictionally supporting a yarn cop, unreeling spindles disposed symmetrically in opposed relation at diametrically opposite sides of said shaft, a yarn guide at the end of said shaft, yarn guides carried by said head at each side of said respective spindles adapted for threading in either direction of rotation of the shaft, and means actuated by the rotation of said head to impart simultaneous relative rotation to said spindles.

15. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a flier carried by said flier shaft comprising a flier head rotatable with said shaft, a yarn cop holder for frictionally supporting a yarn cop, an unreeling spindle carried by said head, a stationary gear co-axial with said shaft, and gearing between said stationary gear and said spindle actuated by the rotation of the head to impart relative rotation to said spindle.

16. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a flier carried by said flier shaft comprising a flier head rotatable with said shaft, a yarn cop holder for frictionally supporting a yarn cop, an unreeling spindle carried by said head, a stationary gear co-axial with said shaft, and a drive shaft geared at one end to said stationary gear and at its other end to said spindle, and adapted upon rotation of the head to impart relative rotation to said spindle.

17. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a flier carried by said flier shaft comprising a flier head rotatable with said shaft, a yarn cop holder for frictionally supporting a yarn cop, an unreeling spindle carried by said head, a

stationary beveled gear co-axial with said shaft, a drive shaft having a beveled gear at one end meshing with said stationary gear, and worm gearing at the other end of said drive shaft for driving said spindle upon rotation of said head.

18. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a flier carried by said flier shaft comprising a flier head rotatable with said shaft, a yarn cop holder for frictionally supporting a yarn cop, unreeling spindles disposed symmetrically in opposed relation at diametrically opposite sides of said shaft and having their axes parallel to the axis of the flier shaft, a stationary gear co-axial with said flier shaft, and gearing between said stationary gear and said spindles actuated by the rotation of said head to impart relative rotation to said spindles.

19. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a flier carried by said shaft comprising a flier head rotatable with said shaft, a tubular yarn cop holder rotatable upon said shaft, retaining means for said holder rotatable with said shaft and axially movable thereon, and spring means yieldably pressing said retaining means inwardly into engagement with said holder to permit relative rotation of the latter.

20. In a wire covering machine, a tubular rotary flier shaft, wire supply means, wire receiving means, the wire adapted to move from said supply means to said receiving means through said shaft, a flier carried by said shaft comprising a hollow sealed flier head rotatable with said head and adapted to contain lubricant, a yarn cop holder carried by said head for frictionally supporting a yarn cop, an unreeling spindle carried by said head, and means disposed within said hollow head actuated by the rotation of said head to impart relative rotation to said spindle.

Signed at Bridgeport in the county of Fairfield and State of Connecticut this 11th day of August A. D. 1925.

AUGUST J. TRENCK.