July 5, 1938. O. G. NELSON 2,122,485

COILING APPARATUS

Original Filed March 23, 1934 4 Sheets-Sheet 1

FIG. 1

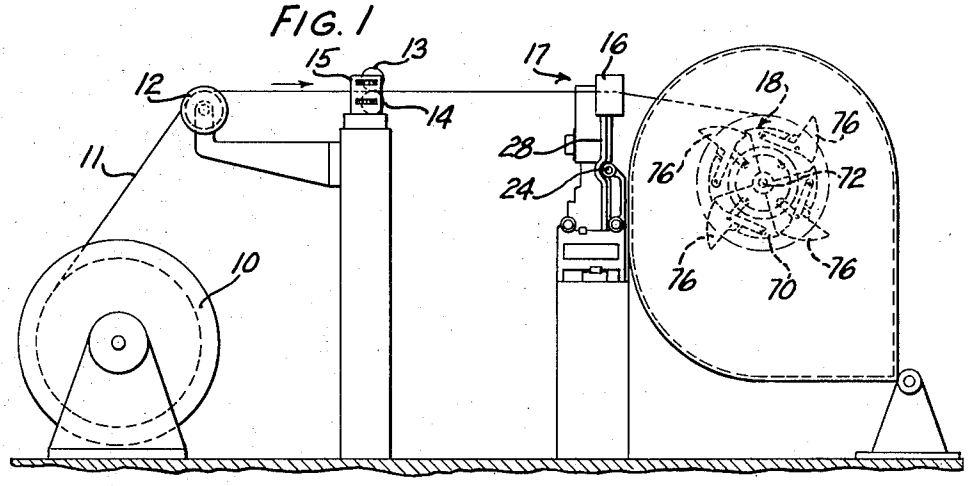
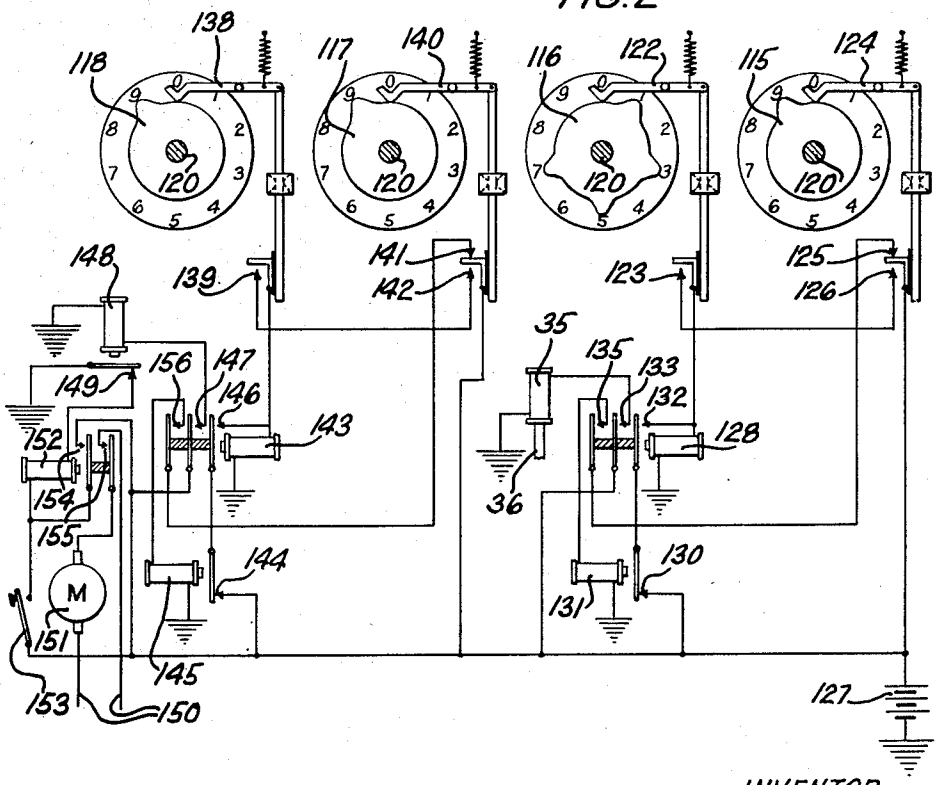


FIG. 2



INVENTOR
O. G. NELSON
BY H. A. Whitehorn
ATTORNEY

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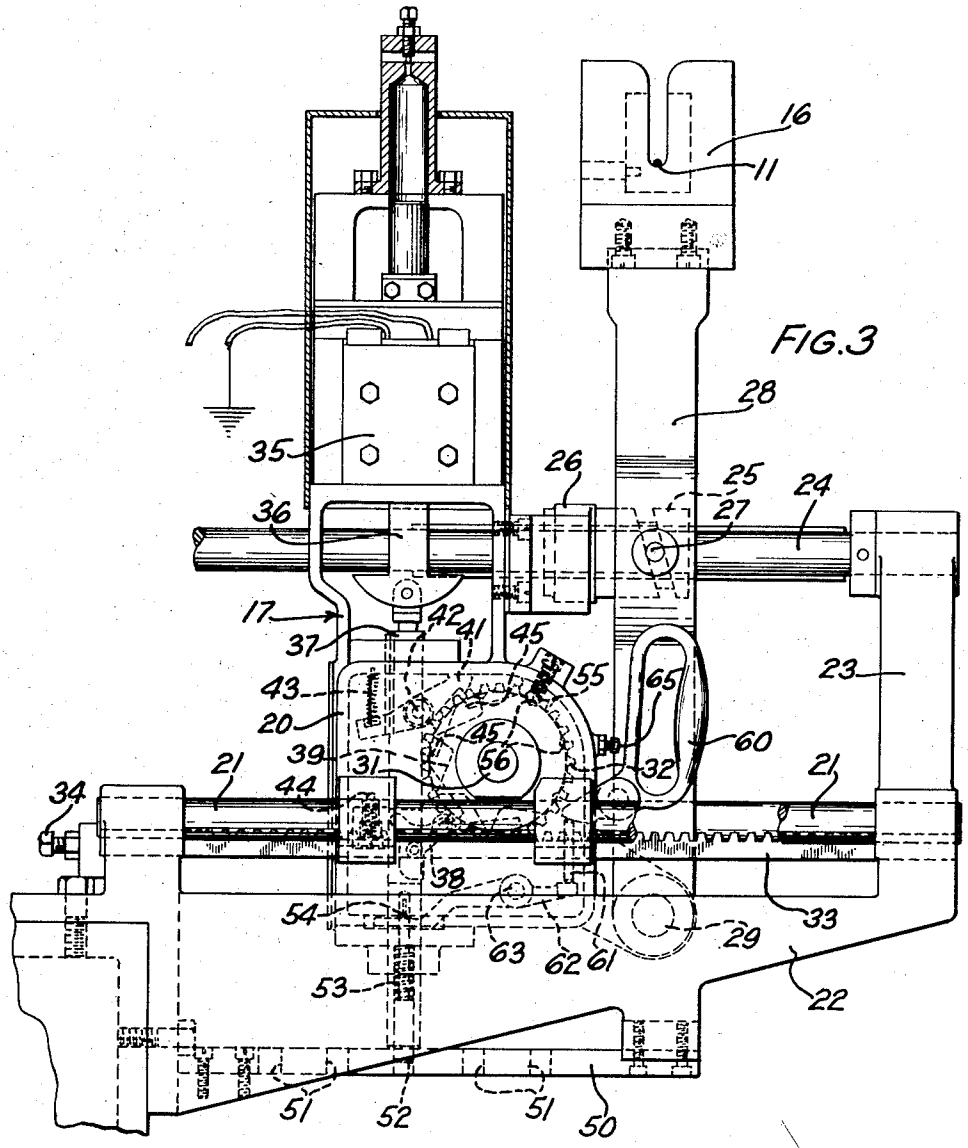


FIG. 3

INVENTOR
O. G. NELSON
BY H. A. Whitehorn
ATTORNEY

July 5, 1938. O. G. NELSON 2,122,485

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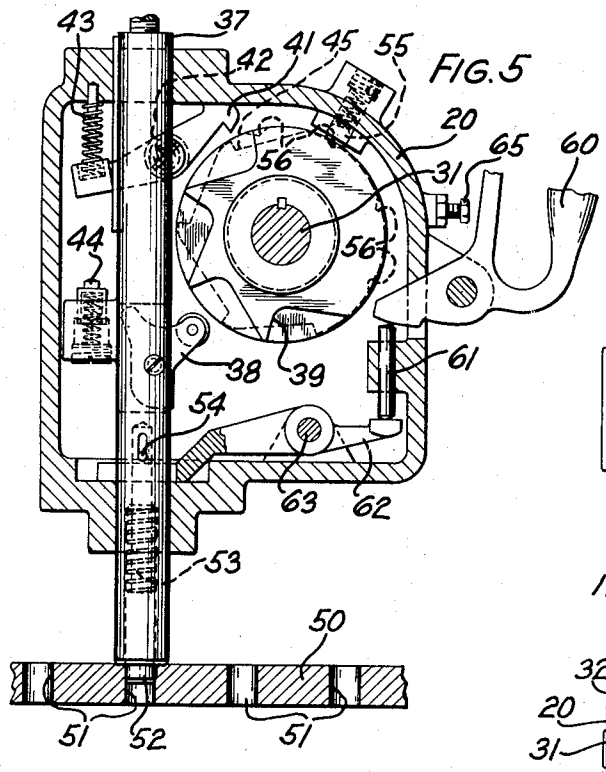


FIG. 5

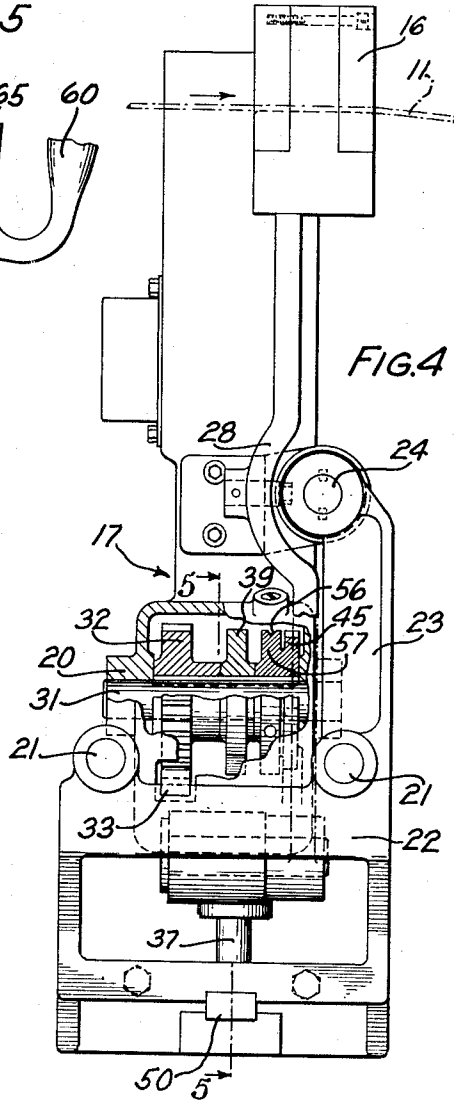


FIG. 4

INVENTOR
O. G. NELSON
BY H. R. Whitehorn
ATTORNEY

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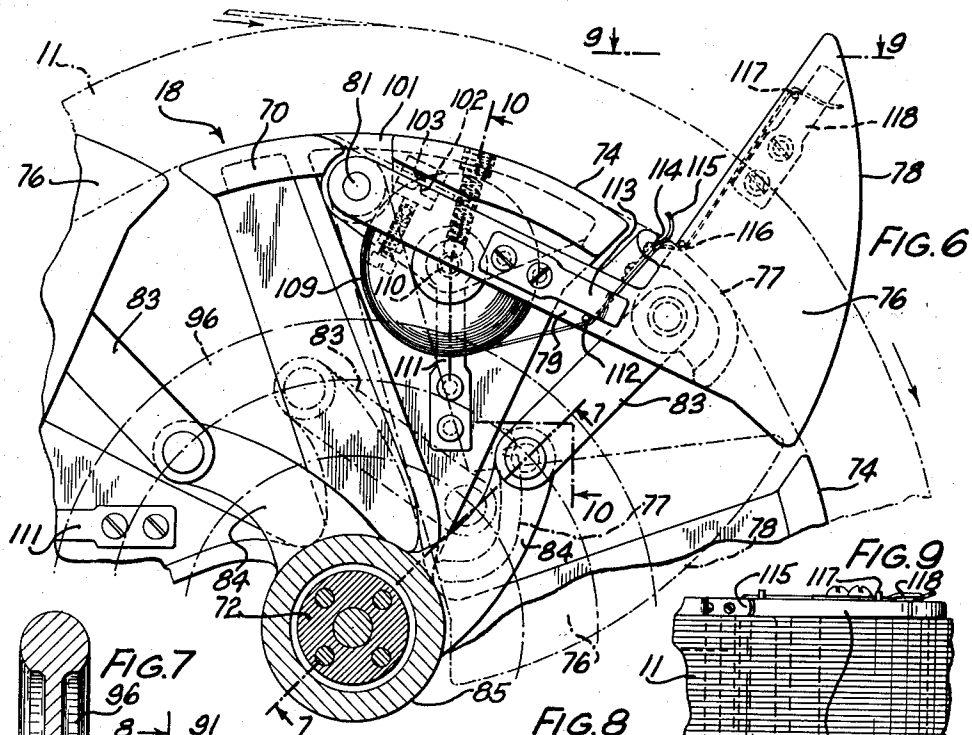


FIG. 6

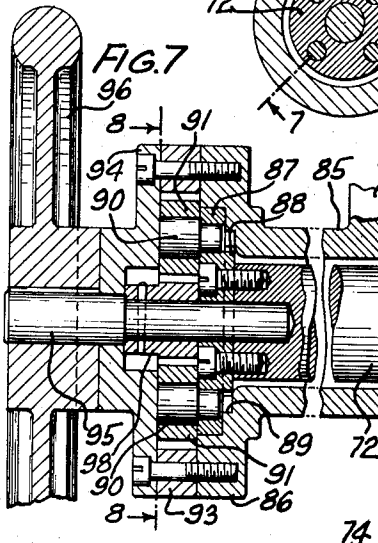


FIG. 7

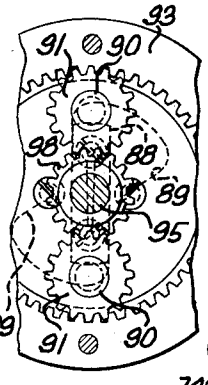


FIG. 8

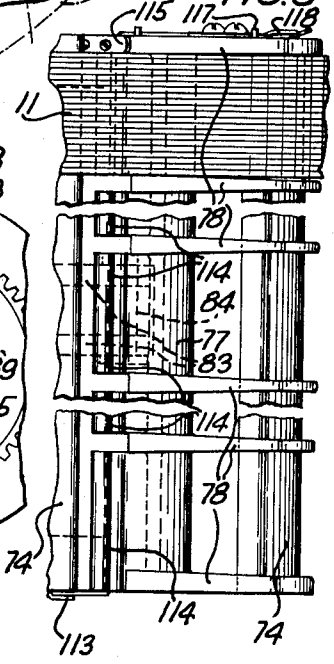


FIG. 9

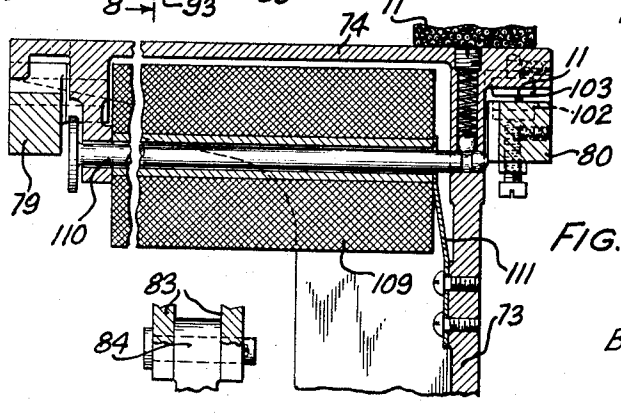


FIG. 10

INVENTOR
O. G. NELSON
BY H. A. Whitehorn
ATTORNEY

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UNITED STATES PATENT OFFICE

2,122,485

COILING APPARATUS

Oscar G. Nelson, Baltimore, Md., assignor to Western Electric Company, Incorporated, New York, N. Y., a corporation of New York

Application March 23, 1934, Serial No. 717,089
Renewed September 17, 1937

16 Claims. (Cl. 242—25)

This invention relates to a coiling apparatus, and more particularly to an apparatus for coiling interconnected measured lengths of strand material.

The apparatus claimed herein is described and illustrated as including a control system described and claimed in the copending application of Walter M. Hill, Serial No. 717,092, filed March 23, 1934.

An object of the invention is to provide a simple, efficient and practical apparatus for successively winding a plurality of coils of strand material, said coils being preferably interconnected.

In accordance with the object, one embodiment of the invention contemplates a coiling machine comprising a distributor having a continuously oscillating material directing arm, automatically shiftable from one position to another with respect to a rotatable coiling head when a coil of material of predetermined length has been wound, the coiling head having partitioning members for separating the coils during winding which members may be simultaneously retracted to permit the removal of the interconnected coils. A plurality of coils are thus produced from a single strand without stopping the machine at the completion of each coil.

Other objects and advantages will be apparent from the following detailed description taken in conjunction with the accompanying drawings, wherein

Fig. 1 is a schematic side elevational view of the apparatus;

Fig. 2 is a wiring diagram illustrating a control system for the apparatus;

Fig. 3 is a front elevational view of the distributor portions thereof being broken away for the purpose of clearness;

Fig. 4 is a side elevational view of the distributor portions thereof being shown in sections;

Fig. 5 is an enlarged fragmentary sectional view taken along the line 5—5 of Fig. 4;

Fig. 6 is an enlarged fragmentary detailed view of the coiling head;

Fig. 7 is a fragmentary sectional view taken along the line 7—7 of Fig. 6;

Fig. 8 is a fragmentary sectional view taken along the line 8—8 of Fig. 7;

Fig. 9 is a fragmentary top plan view taken substantially along the line 9—9 of Fig. 6; and

Fig. 10 is a fragmentary sectional view taken substantially along the line 10—10 of Fig. 6.

Referring now to the drawings wherein like reference numerals designate similar parts throughout the various views, numeral 10 designates a supply reel (Fig. 1) for supplying strand material, such as rubber covered wire 11, which when threaded through the apparatus passes over an idler sheave 12, between rollers 13 and 14 of a counter 15, and through a forked member 16 of a distributor 17 to a coiling head 18 where the forward end of the wire is secured as hereinafter described.

The distributor 17 (Fig. 3) consists of a housing 20 slidably mounted upon horizontal supporting bars 21, the ends of which are fixed in embossed portions of a stationary frame 22. The frame 22 has an upright member 23 forming, at its upper end, a bearing for a continuously rotatable shaft 24 upon which is mounted a drum cam 25 rotatable in a bearing 26 carried by the housing 20 and serving as a bearing for the shaft 24. The drum cam 25 is keyed to the shaft 24 so as to be rotated therewith but is movable longitudinally thereon when movement is imparted to the housing 20. The shaft 24 is operatively connected to a suitable power means (not shown) and is driven to rotate the drum cam 25 which, due to its connection at 27 with an oscillating arm 28, upon which the forked member 16 is mounted, imparts an oscillatory movement to the arm about its pivot 29, the pivot being supported by the housing 20.

Rotatably journaled in the housing 20 is a shaft 31 having mounted thereupon and disposed within the housing a gear 32 (Figs. 3 and 4) the teeth of which interengage teeth of a horizontally disposed rack 33, the latter being carried by the frame 22 and adjustable relative thereto by means of an adjusting screw 34.

Means for rotating the gear 32 for imparting movement to the housing 20 consists of a solenoid 35 having a core 36 fixed to a pull rod 37 which is grooved to receive and pivotally support a pawl 38. A toothed wheel 39 mounted upon the shaft 31, and fixed thereto, is positioned so that the pawl 38 may engage a tooth thereof when the solenoid 35 is energized to move the pull rod 37 upwardly, which upward movement will be sufficient to cause the pawl 38 to rotate the toothed wheel 39 a predetermined distance.

The movement of the housing 20 from one position to another is limited by allowing the shaft 31 to rotate only the required distance. This is accomplished by a latch 41 (Figs. 3 and 5) pivotally mounted at 42 in the housing 20 and urged counterclockwise by a spring 43. The latch 41

is positioned to be engaged by a spring pressed plunger 44 carried by the pull rod 37 when the pull rod is approaching the top of its vertical movement to move the latch 41 clockwise until it engages a tooth of a ratchet wheel 45 to lock the shaft 31 against movement beyond a predetermined distance, the ratchet wheel being keyed to the shaft (Figs. 4 and 5).

When the solenoid 35 is deenergized, the pull rod 37 drops by gravity until it rests upon a locking plate 50 carried by the frame 22. Equally spaced apertures 51 are formed in the locking plate 50 to receive a locking pin 52 which is slidably disposed in the lower end of the pull rod 37, urged downwardly by a spring 53 and limited in its downward movement by a lifting pin 54 carried by the upper end thereof and extending through elongated apertures in the walls of the pull rod.

The latch 41 stops the movement of the housing 20 to properly position the locking pin 52 in general alignment with one of the apertures 51, but in order to prevent movement of the housing during the downward movement of the pull rod to position the locking pin within one of the apertures, the shaft 31 is held against rotation by a spring pressed ball 55 carried by the housing 20 and forced into one of a plurality of properly positioned recesses 56 in the peripheral surface of a locking wheel 57, the latter being keyed to the shaft 31.

The distributor 17 may be manually moved into its original or starting position at the left (Fig. 3) after a coiling operation has been completed. This may be accomplished by forcing a hand lever 60 (Figs. 3 and 5) to the left about its pivot to force a pin 61 downwardly to move a lever 62 about its pivot 63 to move the locking pin 52 upwardly against the force of the spring 53 to free it from the aperture of the locking plate 50 due to the engagement of the left end of the lever 61 with the underside of the lifting pin 54. The hand lever 60 is limited in its movement by an adjusting screw 65.

The coiling head 18 comprises a drum 70 having a hub 71 keyed to a shaft 72 which is rotated continuously through its operative connection with a motor hereinafter described. The hub 71 has radially extending rib members 73 for supporting equally spaced drum sections 74, the outer surfaces of which are arcuate shaped in cross-sectional contour for receiving the wire 11. The spaces between the drum sections 74 are sufficiently large to receive retractable partitioning elements 76, which have horizontally extending wire supporting members 77 of the general contour shown in Figs. 6 and 9 with equally spaced partitioned fingers 78 extending in parallel formation at right angles to the wire supporting members for dividing the coiling head into a plurality of sections or positions, each of which is to receive a measured length of wire to be coiled thereupon. The partitioning elements 76 have integral arms 79 and 80 (Figs. 6, 9 and 10) positioned at the ends thereof and extending beneath their respective drum section 74 where their inner ends are pivotally mounted at 81. The partitioning elements 76 are in the positions shown in solid lines in Fig. 6 during the coiling operation, but after the coiling operation has been completed, they may be moved into the dotted line position shown in Fig. 6 so that the interconnected coils may be readily removed from the drum. It will be noted that the partitioning elements 76 are tapered, as viewed in Fig. 9, being narrower adjacent their extending ends than they are adjacent the drum 70 and that the right edge thereof (Fig. 6) is arcuate in configuration. This construction permits easy withdrawal of the elements 76, after a series of coils have been wound, without damaging the wire.

Links 83 operatively connect the partitioning members 76 to respective arms 84 of a retracting element 85 (Figs. 6 and 7) which element is disposed concentric with the shaft 72 and has a flanged outer end 86 for receiving a controlling member 87. The controlling member 87 is circular in general contour as shown in Fig. 8 having formed on its inner surface a lug 88 substantially rectangular in general contour and receivable in a recess 89 (Figs. 7 and 8) of the contour shown by the dotted lines in Fig. 8 so that the side walls of the lug 88 may engage the side walls of the recess 89 to limit the movement of the controlling member 87. The controlling member 87 is fixed to the end of the shaft 72 by means of screws and has diametrically opposed apertures therein for supporting stub shafts 90 for pinions 91. A ring gear 93 is positioned between the flange 86 and a bearing flange 94, all of which are secured to each other by means of screws or the like, the flange 94 rotatably supporting a shaft 95. A handwheel 96 is keyed to the outer end of the shaft 95, while the inner end of the shaft is journaled in a recessed portion of the shaft 72 and extends through an aperture in the controlling member 87. Fixed to the shaft 95 is a gear 98 which interengages the pinions 91 for rotating the pinions through the rotation of the handwheel 96 to bring about a rotation of the retractable element 85 for moving the partitioning elements 76 inwardly or outwardly as the case may be.

One of the plurality of drum sections 74 is apertured at 101 to receive the forward end of the wire 11 as it is threaded to the coiling head for the purpose of securing the end of the wire thereto preparatory to coiling the wire upon the coiling head. The forward end of the wire is fed through the aperture 101 while the partitioning elements 76 are in their retracted positions shown in dotted lines (Fig. 6) and as the partitioning elements are moved into their solid line positions, which are their outer or operative positions, the arm 80 (Figs. 6 and 10) of the partitioning member of the drum section having the aperture 101 therein, has an adjustable wire gripping member 102 cooperating with a similar wire gripping member 103 carried by the drum section for gripping and firmly holding the forward end of the wire during the coiling operation.

One of the important purposes of this apparatus is to form coils of strand material, such as wire of predetermined measured lengths which may be tied together in coil formation and remain interconnected so that commercially any desired number of coils or lengths of wire may be sold in the interconnected formation. Therefore, one feature of this invention is the provision of coil fastening means in the form of a plurality of spools 109 of cord mounted upon the rib members 73 of the drum and threaded through the partitioning members 76 so that the interconnected coils may be readily tied at spaced positions after the coiling operation has been completed. One of the spools of cord is shown in Figs. 6 and 10 as being rotatably mounted upon a removable pin 110 carried by the drum 70.

A spring member 111 tends to hold the spool 109 against rotation. The cord from the spool

109 passes over a pin 112 on the arm 79 and beneath a spring clip 113 on the same arm after which the cord is passed through longitudinally extending grooves of grooved projections 114 of the member 77 to the opposite end of the partitioning member 76 where the cord is passed beneath a spring clip 115 and from there it passes upon the right side of a pin 116, then upwardly around a pin 117 where it finally passes beneath a retaining clip 118 which holds the end of the cord during the coiling operation.

A control system for energizing the solenoid 35 at predetermined intervals for shifting the distributor from one position to another relative to the coiling head 18 comprises cams 115, 116, 117 and 118 of the counter 15. The cams 115 and 117 are mounted upon a shaft 120 and operatively connected to the counter wheel 14 through an intermittent driving mechanism of the conventional type so that they will be rotated one revolution for each 100 revolutions of the counter wheel. The counter wheel 14 is rotated one revolution for each foot of wire that passes between it and the counter wheel 13 thus causing one rotation of the cams 115 and 117 for each 100 feet of wire passing through the counter.

The cams 116 and 118 are driven intermittently by any suitable and usual mechanisms so that they will be rotated one-tenth of a revolution for each revolution of cams 115 and 117. The cams are all rotated counterclockwise and when 190 feet of wire have passed through the counter 15 the high portion of the cam 116 at position 1 of its indicating wheel will be positioned to actuate a switch controlling mechanism 122 for closing a make contact 123. At the same time the high portion of the cam 115 will be positioned to actuate a switch controlling mechanism 124 to open a break contact 125 and close a make contact 126 in series with contact 123 completing a circuit from a grounded battery 127 through make contacts 126 and 123 and through a transfer relay 128 to ground. It will be understood that while contact 126 will have been closed at 90 feet it will have opened again before the contact 123 closes at 100 feet. The latter remains closed from 100 feet to 200 feet, but it is only at 190 feet during this portion of cycle that both contacts are closed simultaneously. The energization of the transfer relay 128 attracts its armatures for completing a locking circuit from the grounded battery 127 through a break contact 130, a normally closed armature of a locking relay 131, a make contact 132 and through the transfer relay 128 to ground. The energization of the relay 128 also completes a circuit from grounded battery 127 through a make contact 133 and through the solenoid 35 to ground.

The energization of the solenoid 35 moves the distributor 20 from its farthest position at the left (Fig. 3) to the second position so that the forked member 16 of the oscillating arm 28 will direct the wire to the second position upon the coiling head 18. This is accomplished by the attraction of the core 36, due to the energization of the solenoid 35, to move the pull rod 37 upwardly removing the locking pin 52 from its aperture 51 and causing the pawl 38 to rotate the toothed wheel 39, rotating the shaft 31 with the gear 32 and causing a movement to the right of the distributor due to the engagement of the gear 32 with the rack 33. The rotation of the gear 31 will be stopped by the movement of the latch 41 into engagement with the ratchet wheel 45 and after the solenoid 35 is deenergized the spring pressed ball 55 and its association with the recessed wheel 57 will hold the distributor against movement until the locking pin 52 is disposed in the second aperture 51. The relay 128 remains energized until the high portion of the cam 115 is moved out of operative engagement with the switch controlling mechanism 124 at which time the make contact 126 is opened and the break contact 125 is closed completing a circuit from grounded battery 127 through break contact 125, make contact 135, through the locking relay 131 to ground causing an attraction of the armature of the locking relay away from the break contact 130 to open the locking circuit through the transfer relay 128 thus deenergizing it. The deenergization of the transfer relay 128 breaks the circuit through the locking relay 131 allowing the armature thereof to resume its closed position. This operation is repeated when 390, 590 and 790 feet of wire have passed through the counter to shift the distributor successively from one position to another relative to the coiling head.

The other portion of the circut shown in Fig. 2 remains ineffective until 990 feet of wire have passed through the counter at which time the high portion of the cam 118 will be moved to operate a switch actuating mechanism 138 to close a make contact 139 and at the same time the high portion of the cam 117 will be moved to operate a switch actuating mechanism 140 to open a break contact 141 and to close a make contact 142 in series with contact 139, completing a circuit from grounded battery 127, through make contacts 142 and 139 and through a length relay 143 to ground. The energization of the length relay 143 will attract its armatures to complete a locking circuit from grounded battery 127 through a break contact 144, through an armature of a locking relay 145, through make contact 146 and through the length relay 143 to ground. The energization of the length relay 143 also completes a circuit from grounded battery 127 through a make contact 147 and through a stop relay 148 to ground. The energization of the stop relay 148 attracts its armature to move it away from a break contact 149 to open a circuit for deenergizing a magnetic switch for a motor circuit 150 of a motor 151. The magnetic switch consists of a relay 152 which is energized when a momentary push switch 153 is closed completing a circuit from grounded battery 127, through switch 153, relay 152, the break contact 149 to ground. A locking circuit for the relay 152 is traced from grounded battery 127 through make contact 154, relay 152, break contact 149 to ground when the armatures of the relay are attracted. The motor circuit 150 is completed through the make contact 155 and will remain closed until the stop relay is energized to open break contact 149. The motor 151 shown diagrammatically in Fig. 2 is operatively connected to the shaft 72 of the coiling head for continuously rotating the shaft during the coiling operation, the breaking of the circuit to the motor causing the coiling head to stop rotating when the desired length of wire has passed through the counter.

The cam 116 which travels at the same rate as cam 118 has no high portion at position 9 so that the mechanism controlled by cam 116, is not operated at 990 feet when cam 118 becomes effective.

The relay 143 remains energized through the locking circuit until the high portion of the cam 117 is moved so as to allow the switch actuating mechanism 140 to open the make contact 142 and close the break contact 141, completing the circuit from grounded battery 127 through break contact 141, through make contact 156 and through the locking relay 145 to ground, energizing the locking relay to move its armature free of the break contact 144 to open the locking circuit to deenergize the relay 143. This does not happen, however, until the last foot of the coil is being completed.

In preparing the coils to be removed from the coiling head, the coils are tied at spaced positions with the cord from the spools 109. The cord at each position is disposed adjacent the inner periphery of the coils and the cord may be drawn outwardly between each coil, starting between the coils adjacent the free end of the cord until a sufficient amount of cord has been drawn from each of the spools to tie the coils at the various positions, after which the desired lengths of cord may be cut and the coils tied.

The portions 77 of the partitioning members 76, when in their outer positions, extend beyond the circumference of the drum so that when the partitioning members are retracted the coils will be sufficiently loose upon the drum so that they may be readily removed therefrom. The handwheel 96 (Figs. 6 and 7) may then be rotated clockwise to rotate the gear 98 clockwise and impart a counterclockwise rotation to each of the pinions 91, thus rotate the pinions 91 with the ring gear 93 counterclockwise, rotating the retarding member 85 with its arms 84 in the same direction until the partitioning members 76 are moved from their outer positions, shown in solid lines (Fig. 6) to their inner positions shown in dotted lines. While in this position the partitioning members are free of the coils and the coils may be readily removed from the coiling head, the length of wire forming the coils wound upon the coiling head is severed from the supply and the operation may be repeated by inserting the forward end of the wire which has been severed from the previously wound coils through the aperture 101 of the coiling head and by rotating the handwheel 96 counterclockwise the partitioning members 76 may be moved to their outer positions, clamping the forward end of the wire between the gripping members 102 and 103.

Prior to starting each operation the counter 15 is turned to zero position and the distributor 17 is moved to its farthest position to the left (Fig. 3). The motor 151 is then energized by closing the motor circuit and the coiling head is rotated continuously, receiving in the first position the wire 11 which is guided thereupon by the continuously oscillating forked member 16 of the arm 28 until 190 feet of wire have been wound thereupon, at which time the circuits are completed through the actuation of the cams 115 and 116 (Fig. 2) to energize the solenoid 135. The upper portion of the core 36 is formed into a piston which is slidably disposed in a cylinder of which the air outlet is limited through a valve (Fig. 3) so that the action of the core to actuate the distributor moving mechanism associated therewith is moderately slow to prevent injury to the movable parts which might possibly occur if such a cushioning means were not provided. Therefore, during the actuation of the distributor moving means to move the distributor from one position to another, the additional 10 feet of wire are wound upon the first position of the coiling head to complete the 200 feet of wire in the first coil. The oscillating distributing arm 28 continues its distributing movement to guide the wire upon the second position of the coiling head until this coil is completed and so on until the five coils have been completed, the distributor being automatically shifted with respect to the coiling head at the completion of each coil and the apparatus is automatically stopped when the total of 1,000 feet of wire have been wound. The lengths of wire on each coil and the total of the five coils, as given, are of course merely illustrative and the counter can be designed to produce coils of any desired length.

Although one particular embodiment of the apparatus is shown and described herein, it should be understood that the apparatus is capable of other adaptations and modifications without departing from the spirit and scope of the appended claims. For example, in the embodiment illustrated the wire is not spooled but certain features of this invention are obviously adapted to be used in connection with coiling wire on spools.

What is claimed is:

1. In a coiling apparatus, a rotatable coiling head for coiling material, material guiding means supporting a distributor for distributing a material upon the coiling head, an actuating member, means for imparting movement to said actuating member, means responsive to the movement of said actuating member for moving said distributor from one position to another relative to said coiling head for forming spaced coils of material upon said coiling head, another means also responsive to the movement of said actuating member, which for each movement limits the travel of the distributor to a predetermined winding position, and means for locking the material guiding means in each position.

2. In a coiling apparatus, a rotatable coiling head for coiling material, a guiding member for guiding the material upon the coiling head, a support for the material guiding member, an actuating member carried by said support, means for moving said actuating member, means actuated by the movement of said actuating member in one direction for moving the support a predetermined distance relative to the coiling head for causing the winding of spaced coils of the material upon the coiling head, a fixed member, and means carried by said actuating member and cooperating with said fixed member for locking the support in the position into which it is moved.

3. In a coiling apparatus, a rotatable coiling head for coiling material, a material guiding member for guiding the material upon the coiling head, a housing for supporting the material guiding member mounted for movement relative to the coiling head, an actuating rod movably carried by said housing, a fixed rack, a gear interengaging said rack and rotatably disposed in said housing, and means actuated by the movement of said actuating rod in one direction for rotating a gear for causing movement of the housing for moving the material guiding member relative to the coiling head.

4. In a coiling apparatus, a rotatable coiling head for coiling material, a material guiding member for guiding the material upon the coiling head, a housing for supporting the material guiding member mounted for movement relative to the coiling head, an actuating rod movably carried by said housing, a fixed rack, a gear interen-

gaging said rack and rotatably disposed in said housing, means actuated by the movement of said actuating rod in one direction for rotating a gear for causing movement of the housing for moving the material guiding member relative to the coiling head, a locking pin carried by said actuating rod, a fixed member apertured at spaced positions for receiving the locking pin, the locking pin being moved into one of the apertures of the fixed member during the movement of the actuating rod in another direction for locking the housing against movement.

5. In a coiling apparatus, a rotatable coiling head for coiling material, a material guiding member for guiding the material upon the coiling head, a housing for supporting the material guiding member mounted for movement relative to the coiling head, an actuating rod movably carried by said housing, a fixed rack, a gear interengaging said rack and rotatably disposed in said housing, means actuated by the movement of said actuating rod in one direction for rotating a gear for causing movement of the housing for moving the material guiding member relative to the coiling head, a locking pin carried by said actuating rod, a fixed member apertured at spaced positions for receiving the locking pin, the locking pin being moved into one of the apertures of the fixed member during the movement of the actuating rod in another direction for locking the housing against movement, and means for removing the locking pin from the aperture in which it is disposed in the fixed member so that the housing may be moved relative to the coiling head.

6. In a coiling apparatus, a rotatable drum for receiving and winding material thereupon during rotation, said drum having spaced material engaging surfaces for receiving the material, a partitioning member disposed between the material engaging surfaces of said drum, and having material engaging portions positioned beyond the circumference of the material engaging surfaces of the drum and engaging the inner surface of the wound coil, and means for moving said partitioning member relative to the drum for loosening the material upon the drum and positioning the partitioning member so that the material may be removed from the drum.

7. In a coiling apparatus, a rotatable drum, means for serving material to the drum, means carried by the drum for forming a plurality of positions upon the drum, means for moving the material serving means from one position to another relative to the drum for forming a coil at each position, and means carried by the drum for tying the material of each coil in the coil formation, said last mentioned means including means for supporting a supply of tying material.

8. In a coiling apparatus, a rotatable drum having a cut out portion, a retractable partitioning member carried by said drum, means for moving said partitioning member relative to said drum, means rendered effective by the movement of said partitioning member in one direction for gripping the forward end of material to be wound upon the drum, means for rotating the drum for winding the material thereon, means for distributing the material upon the drum for directing the material to spaced positions upon the drum for forming spaced coils of the material thereupon, and parallel projections carried by the partitioning member for separating the spaced coils upon the drum.

9. In a coiling apparatus, a drum for receiving material to be wound thereon, a partitioning member having projections for dividing the material into spaced coils, a spool of fastening material carried by the drum, the partitioning member having grooved projections for receiving the fastening material threaded therethrough, means for holding the free end of the fastening material, and means for serving the material to the drum to form spaced coils thereupon, the fastening material in the grooved projections of the partitioning member being positioned adjacent the inner peripheries of the coils so that predetermined lengths of the fastening material may be severed from the spool for fastening the material in the formed coils.

10. In a coiling mechanism, a drum for receiving material to be coiled, said drum having spaced coil receiving portions, an oscillating distributor, means for oscillating said distributor, a normally stationary carriage for said distributor slidably mounted to move parallel to the axis of said drum, and means for shifting said carriage at predetermined intervals to positions corresponding to said coil receiving portions in succession.

11. In a coiling mechanism, a drum for receiving material to be coiled, said drum having spaced coil receiving portions, a normally stationary carriage slidably movable in a direction parallel to the axis of said drum, an oscillating distributor on said carriage, means for oscillating the distributor in the several positions of the carriage, means for shifting the carriage to positions corresponding to said coil receiving portions in succession, and means for controlling said shifting means to operate at predetermined intervals.

12. In a coiling mechanism, a drum for receiving material to be coiled, retractable partitioning members for dividing the drum axially into coil receiving spaces, means for carrying a supply of binding material for the coils associated with the drum, and means secured to said retractable members for positioning binding material for a wound coil.

13. In a coiling mechanism, a drum for receiving material to be coiled, a distributor, means for shifting the distributor to form separable coils on the drum comprising a rack, a gear mounted in fixed relation to the distributor, and means operated at predetermined intervals for rotating said gear to shift the distributor.

14. In a coiling mechanism, a drum for receiving material to be coiled, a distributor for winding separable coils on the drum, means for shifting said distributor including a fixed rack, a gear carried by the distributor and engaging the rack, means for normally preventing rotation of said gear, a member for rotating said gear, means for limiting the movement of said member to rotate said gear a predetermined amount, and means for actuating said member at predetermined intervals.

15. In a coiling mechanism, a drum for receiving material to be coiled, a distributor, means for shifting the distributor longitudinally of the drum comprising a fixed rack, a gear associated with the distributor and engaging the rack, a ratchet wheel for driving said gear, a reciprocating member for actuating said ratchet wheel, means carried by the reciprocating member and cooperating with the ratchet wheel for positively rotating said gear a predetermined distance, and means for reciprocating said member at predetermined intervals.

16. A control system for a coiling mechanism comprising a drum for receiving material to be coiled, a distributor, means for shifting the distributor to form separable coils on said drum, a stationary rack, a rotatable gear mounted in fixed relation to the distributor and engaging said rack, magnetically actuated means for rotating said gear, and means for energizing said magnetically actuated means at predetermined intervals.

OSCAR G. NELSON.