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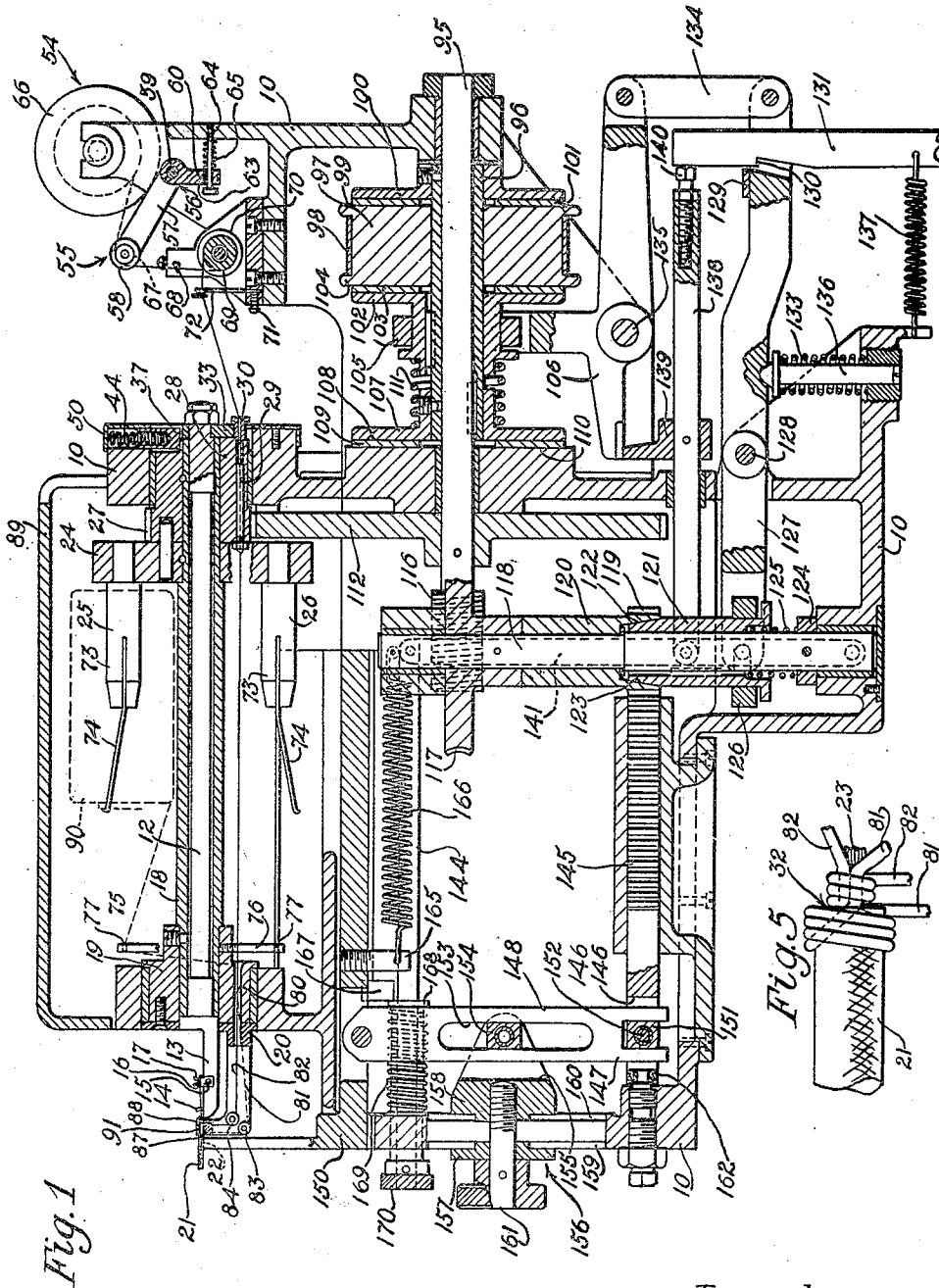
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C. O. HAASE

STRAND WHIPPING MECHANISM

Filed August 9, 1924

2 Sheets-Sheet 1



Inventor
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by *Att'y.*

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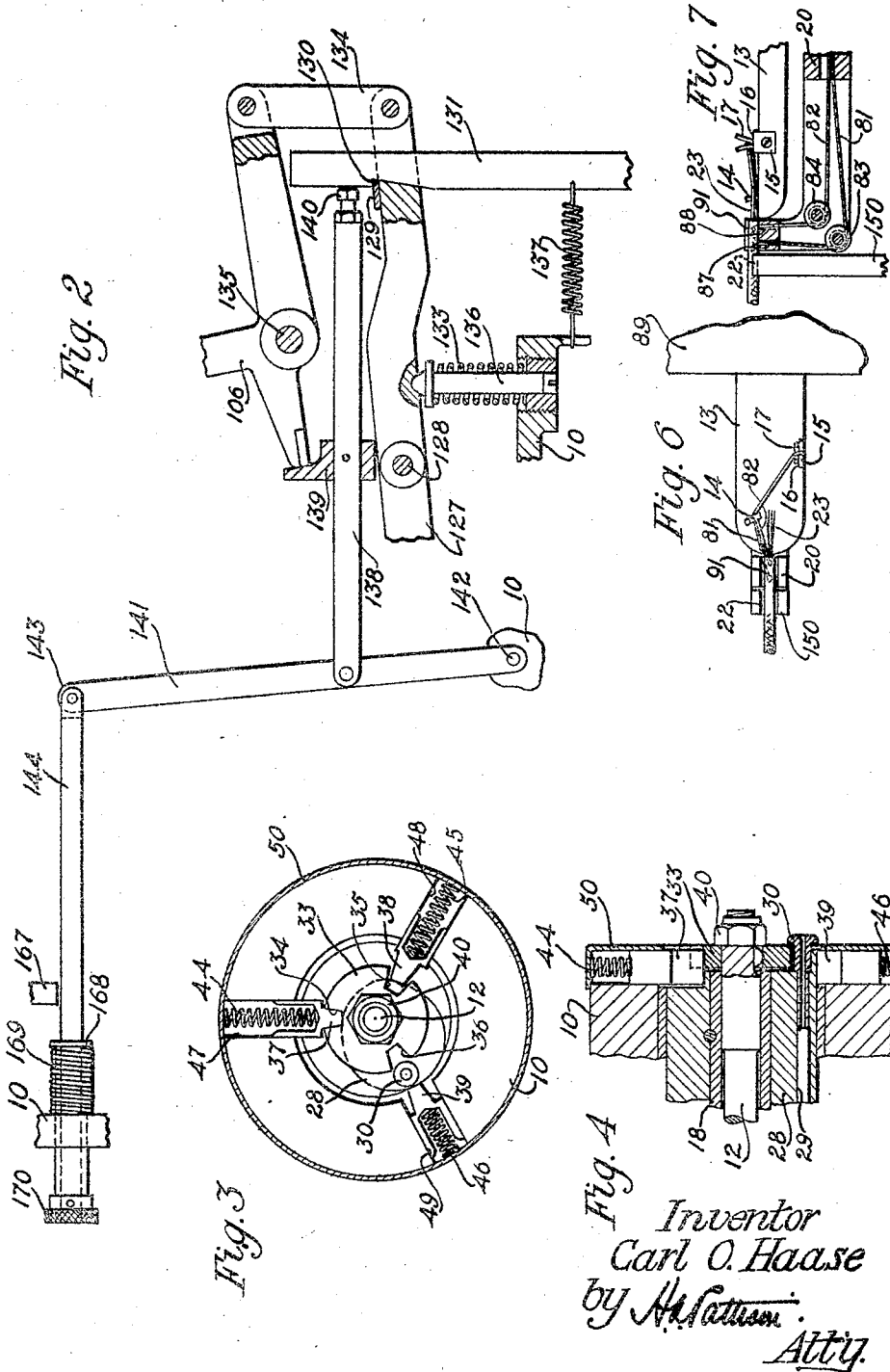
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STRAND WHIPPING MECHANISM

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE.

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STRAND-WHIPPING MECHANISM.

Application filed August 9, 1924. Serial No. 731,038.

To all whom it may concern:

Be it known that I, CARL ODENWALD HAASE, a citizen of the United States, residing at Winnetka, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Strand-Whipping Mechanisms, of which the following is a full, clear, concise, and exact description.

This invention relates to strand whipping mechanisms, and more particularly to a mechanism for whipping telephone cords with strand material preparatory to securing terminals thereto.

An object of the invention is to mechanically whip cores with strand material accurately, speedily and with a minimum amount of manual labor.

Another object of the invention is to provide a mechanism for whipping the end of a core with a plurality of strands.

In accordance with the general features of the invention there is provided a whipping device which simultaneously draws wire and thread from their respective supply sources, and simultaneously whips both the thread and the wire about the end of a telephone cord which is automatically moved back the desired distance for each turn of the wire and thread whipped on the cord. The wire is applied to the electrical conductor of the cord and may be soldered to the terminal while the thread is applied to the end portion of the braided covering of the cord to prevent fraying thereof. A member, in which the ends of the wire and thread are held during the whipping operation, is maintained in a central and stationary position in relation to the revolving whipping device. This stationary member is provided with a surface to sever the wire and thread after the whipping operation is completed.

Other objects and advantages of the invention will more fully appear from the following detailed description taken in connection with the accompanying drawings which illustrate one embodiment thereof and in which,

Fig. 1 is a fragmentary elevation partly in section of the whipping mechanism;

Fig. 2 is an enlarged fragmentary view

showing the starting and stopping mechanism of the whipping mechanism shown in Fig. 1;

Fig. 3 is an enlarged detailed view of the mechanism for maintaining the holding and severing devices in a stationary position;

Fig. 4 is a side view of the structure shown in Fig. 3;

Fig. 5 is an enlarged view of a portion of a cord with an end whipped with wire and thread clearly showing the way the thread and wire are laid thereon;

Fig. 6 is an enlarged plan view of the whipping arm, and

Fig. 7 is an enlarged view of the whipping arm as shown in Fig. 1.

Referring now to the drawings in detail in which like reference numerals designate similar parts throughout the several views, 10 denotes a housing which may be suitably supported on any usual type of a bench (not shown). Formed on one end of a longitudinal shaft 12 is a member 13 which carries a small bent guide pin 14 (Figs. 6 and 7). Secured to one side of the member 13 is a cutting blade 15, the knife edge 16 of which is slightly tapered. Interposed between the blade 15 and the side of the member 13 is a retaining clip 17. It will be noted, as best shown in Fig. 6, that the guide pin 14 is on one side of the top surface of the member 13 and the blade 15 and the retaining clip 17 are on the other side.

Surrounding the shaft 12 is a sleeve 18 on one end of which is secured a circular member 19 on which is formed a whipping arm 20 (Fig. 1). Splined to the other end of the sleeve 18 is a disk 24 on which bobbin or cop holders 25 and 26 are mounted. Contiguous with and secured to the disk 24 is a gear 27 on which is formed a long hub 28 which is eccentric on its end as best shown in Figs. 3 and 4. Extending through the hub 28 and gear 27 is a bore 29 in which is inserted a bushing 30.

Secured to the other end of shaft 12 is a ring 33 (Figs. 3 and 4) having three slots 34, 35, and 36, equally spaced from each other, in which plungers 37, 38, and 39, respectively, are adapted to be inserted (Figs.

3 and 4). The shaft 12 is at all times maintained in a stationary position by these plungers, the operation of which will be more fully described hereinafter.

5 The ring 33 is held in position on the stationary shaft 12 (Fig. 4) adjacent to the hub 28 by a nut 40 threaded on the end of the protruding shaft 12. The plungers 37, 38, and 39 are pressed inwardly by compression springs 44, 45, and 46, respectively. 10 The plungers 37, 38, and 39 and the springs 44, 45, and 46 are mounted in slots 47, 48, and 49, respectively, in the housing 10 and thus at all times are kept from revolving. 15 The end of that part of the housing 10 in which the plungers and springs are mounted is covered with a cover 50 which may be removed whenever it is necessary to repair or replace the springs and plungers.

20 Positioned at the rear of the end of the shaft 12 is a wire supply spool 54 (Fig. 1) which is rotatably mounted in the housing 10. Pivotaly mounted below the supply spool 54 is a tension arm assembly, denoted 25 generally by reference numeral 55, which consists of a bell crank lever 56 on one arm 57 of which is rotatably mounted a small grooved pulley 58. The lever 56 is pivotaly mounted at point 59 to the housing 10. An 30 arm 60 of the lever 56 is provided with a bore 63 in which is inserted a bolt 64 which is screwed into the housing 10. Interposed between the bolt 64 and the lever arm 60 is a compression spring 65 which pushes the arm 60 outwardly on the bolt 54 causing the 35 other arm 57 to press against a head 66 of the supply spool 54, acting as a brake thereon. The bore 63 of the arm 60 is considerably larger in diameter than the diameter of the bolt 64 so as to permit the arm 60 to 40 freely ride on the bolt 64.

45 Located in alignment with a groove 67 of the grooved pulley 58 is a helical spring guide 68 which is also in alignment with groove 69 of another grooved pulley 70, rotatably mounted upon a portion of the housing 10. Secured to the housing by a small screw 71 is another guide 72 which is also arranged in a similar relation to the 50 grooved pulley 70.

55 Each of the holders 25 and 26 consists essentially of an arbor 73 in the center of which is secured a spring retaining member 74. Secured to the ring 19 surrounding the sleeve 18 are two guide pins 75 and 76 each having a hole 77 in their end.

60 The ring 19 is provided with a bore 80 through which a thread 81 and a wire 82, to be used in whipping, passes. The bore 80 of the ring 19 is in alignment with a bore 62 in the whipping arm 20. Rotatably mounted in the end of the whipping arm are two small sheaves 83 and 84, the lower one 83 being a guide for the thread 81 and the 65 upper one being a guide for the wire 82.

These sheaves 83 and 84 have grooves which are in alignment with two bores 87 and 88, respectively, in the end of the whipping arm 20 from which the thread and wire emerge. The end of the whipping arm 20 is 70 provided with a groove 91 somewhat V-shaped in which the end of the cord to be whipped is placed, the bottom of the groove being in alignment with the top of the member 13. 75

The bobbin holders 25 and 26 may from time to time, when necessary, be refilled with bobbins very readily and easily by opening the cover 89 which covers the upper 80 portion of the whipping mechanism. Furthermore, it is to be understood that although only one thread bobbin 90 is shown in the drawings, additional bobbins may be employed in like manner.

85 Positioned below the supply spool 54 is a shaft 95 which is rotatably supported in suitable bearings in the housing 10. Surrounding this shaft is a sleeve 96 which is suitably splined to it. Rotatably mounted 90 upon the sleeve, but not secured thereto, is a pulley 97 which may be driven from any suitable source of power by a belt 98 or the like. Secured to the sleeve 96 intermediate 95 the end of the housing 10 and one flange 99 of the pulley 97 is a clutch member 100 whose face is provided with a cork insert 101, which is contiguous with the face of the head 99 of the pulley 97. Mounted on the 100 other side of the pulley 97 and surrounding and secured to the sleeve 96 is a similar clutch member 102 which also has a cork insert 103 which is contiguous with the face 105 of the other head 104 of the pulley 97. The clutch member 102 is straddled by a forked end 105 of a lever 106. Surrounding the sleeve 96 and secured thereto is a brake 165 member 107 having a large face plate 108 which is also provided with a cork insert 109 which is contiguous with the portion of the housing designated by numeral 110. Interposed between the clutch member 102 and the braking member 107 and surrounding the sleeve 96 is a spring 111. Keyed to the 115 shaft 95 is a gear 112 which meshes with gear 27 which drives the whipping mechanism as will be more fully described hereinafter.

120 Formed on the end of the shaft 95 is a worm 116 which meshes with a worm gear 117 secured to a vertical shaft 118. Mounted on the vertical shaft 118, but not secured thereto, is a gear 119 having a long hub portion 120, the end of which engages the end of the hub of the gear 117. Surrounding the lower portion of the shaft 118 is a sleeve member 121 which is tapered at one 125 end 122, the tapered end 122 fitting loosely in a tapered hole 123 in the end of gear 119. Surrounding and splined to the shaft 118 is a small thrust collar 124 which rests on top 130

of the housing 10. Interposed between this collar 124, and the end of the sleeve member 121, is a compression spring 125.

The end of the member 121 is straddled by a forked end 126 of a lever 127 which is pivoted at a point 128 to the housing 10. Secured to the top of the lever 127 is a small plate 129 which is adapted to engage a shoulder 130 formed in a lever 131, which is pivotally secured to any usual type foot pedal (not shown). Pivoted at one end of the lever 127 is a link 134 which is pivotally mounted upon one end of the lever 106 pivoted at a point 135 in the housing. Positioned in the housing 10 under the lever 127 is a pin 136 around which is a compression spring 133 which normally forces the pin upwardly against the lever. Interposed between the housing 10 and the lever 131 is a spring 137 which draws the lever 131 inwardly when the machine is idle so that its shoulder 130 will engage plate 129.

Suitably supported in bearings in the housing is a rod 138 to which is keyed a detent member 139 which engages the under surface of the lever 106. One end of the rod 138 is provided with an adjusting screw 140, the head of which abuts against the upper end of the lever 131. The rod 138 is pivotally secured at its other end to a vertical rod 141 (Fig. 2) which is located in the rear of shaft 118 and is pivotally mounted at one end 142 in the housing 10, the other end 143 being pivotally fastened to the end of a rod 144.

The gear 119 (Fig. 1) meshes with a rack 143 which is reciprocally mounted in the housing 10. One end of the rack 145 is provided with a groove 146 in which rides a bifurcated end 147 of a lever 148, the other end of the lever 148 being pivotally secured to a cord support 150. A block 151 is located intermediate the arms of the bifurcated end of the lever 148 and is pivotally secured to the rack 145 by a pin 152. The lever 148 is provided with a slot 153 in which rides a block 154 pivoted to the bifurcated end 155 of an adjusting device 156. The adjusting device 156 consists essentially of two elements 157 and 158 adapted to ride in keyways 159 and 160, respectively, formed in the housing 10. The element 157 has a thumb screw 161 which is adapted to engage the element 158. By loosening the pin 161 the elements can be moved up or down in their respective keyways 159 and 160 to vary the fulcrum point of lever 148 and to thereby vary the distance which the cord support 150 will be moved from the whipping arm 20. The end of the rack 145 abuts against a rubber element 162 which minimizes the jars and jerks of the machine.

Secured to the cord support 150 is a pin 165 in which one end of a tension spring

166 is secured, the other end of the spring 166 being fastened to the housing 10. Also secured to the support 150 is a stud 167 which is adapted, when the support 150 is moved outwardly, to engage a collar 168 formed on the rod 144. Interposed between the collar 168 and the housing 10 and surrounding the rod 144 is a compression spring 169. It will be noted that the rod 144 protrudes through the housing 10 and the end thereof is provided with a small cap 170. Furthermore, when the mechanism is idle the spring 169 is compressed and the rod 144 assumes the position shown in Fig. 2. When the mechanism is in operation the compression spring 169 is not in its compressed state as shown in Fig. 1.

The operation of this mechanism is as follows: The wire 82 is withdrawn from the spool 54 by the operator and threaded over the pulley 58, through the guide 68, around the pulley 70, through the guide 72, through the bushing 30, through the bore 80 of the ring 19, through the bore 88 in the top of the whipping arm 20, around the pin 14 and the end thereof inserted in the retaining clip 17 on member 13.

Thread 81 is then drawn by the operator from the bobbin 90 through the hole 77 in the guide pin 75, through bores 80 and 62, around the sheave 83 of the whipping arm 20, through the bore 87 at the end of the whipping arm 20, around the pin 14 and the end thereof also inserted in the retaining clip 17. A telephone cord 21 to be whipped previously having had a portion of its braided insulation removed exposing the end of its electrical conductor 23 is then placed into the V-shaped groove 22 of the cord support 150 with the end of its exposed conductor 23 and a portion of the braided insulation 32 adjacent the exposed conductor (Fig. 5) lying on the wire and thread in the V-shaped groove 91 of the whipping arm 20. It is of course apparent that the operator must hold the cord 21 in this position until the whipping operation is completed.

As shown in Fig. 2 when the mechanism is standing idle the shoulder 130 of the lever 131 is in engagement with the plate 129 secured to the top of the lever 127. By stepping on the foot pedal (not shown) the operator draws the lever 131 downwardly by causing one end of the lever 127 to be pulled downwardly. The lever 127 through the link 134 pulls one end of the lever 106 downwardly disengaging the under surface of the lever 106 from the detent member 139 which results (Fig. 2) in the spring 169 expanding and imparting a longitudinal motion to the rod 144, a swinging motion to the rod 141 and a longitudinal motion to rod 138 pivotally secured to rod 141 intermediate its ends. This longitudinal motion of rod 138 causes

the screw 140 to come in contact with the upper end of lever 131, moving it outwardly, thus disengaging the shoulder 130 thereof from the plate 129 of lever 127 as best shown in Fig. 1 and also causes the detent member 139 to come in contact with the under surface of lever 106, preventing the spring 137 from pushing the lever 127 upwardly. The lever 127 upon being pulled downwardly by means of the forked end 105 of lever 106 causes the clutch members 102 and 104 to be tightly pressed against the power driven pulley 97 which causes them and shaft 95 to revolve. It will be noted that clutch member 102 in being brought into contact with the pulley causes spring 111 to expand.

The eccentric hub 28 is caused to rotate through the gears 27 and 112 and in so doing periodically pushes one by one the plungers 37, 38, and 39 out of engagement with their respective slots 34, 35, and 36 formed in the ring 33 which is integral with the shaft 12. It will be noted that it is through this action of the eccentric hub 28 that the wire 82 is enabled to rotate around the shaft 12 with the whipping arm 20, the bushing 30 through which the wire 82 passes being in the eccentric part of the hub 28. It is to be understood that the slots 34, 35, and 36 are arranged equally apart in the ring 33 so as to permit two of the three plungers 37, 38, and 39 to be always in engagement with their respective slots which enables the shaft 12 to be always maintained in a stationary position, inasmuch as the plungers are mounted in the housing 10.

The sleeve 18 in rotating carries with it the whipping arm 20 which withdraws the thread 81 and the wire 82 from their respective supply sources and applies it about the cord 21 in such a manner as to cause the wire 82 to be wound around the end of the exposed conductor 23 of the cord 21 and the thread 81 to be whipped about a portion of the braided insulation 32 on the cord 21 (Fig. 5). Furthermore, it is especially noteworthy that the wire 82 is wound about the end of thread 81, thereby causing the end of the thread to be held in a secure manner. Although only one thread 81 is shown in the drawing for whipping the portion of the braided insulation 32, it is to be understood that the mechanism herein disclosed is also adapted to whip a plurality of such threads about the portion 32 of the cord.

The shaft 95 in rotating causes worm gear 117 to revolve, which is secured to the shaft 118. The end of the lever 127 in being pulled downwardly actuates the member 121 upwardly, pushing the tapered end 122 thereof into frictional engagement with the tapered walls of the hole 123 in the end of gear 119 causing gear 119 to rotate, inasmuch as member 118 is frictionally engaged at one end by the revolving gear 117 and

at the other end by the revolving member 121 slidably keyed to shaft 118. The gear 119 actuates the rack 145 in a direction indicated by the arrow, which through the lever 148 causes the cord support 150 to be moved outwardly from the whipping arm 20, thereby resulting in the wire 82 and thread 81 being spirally wound around the cord 21.

By loosening the elements 157 and 158 of the adjusting device 156 and moving them upwardly or downwardly in their respective keyways 159 and 160, the fulcrum point of the lever 148 may be varied, thereby enabling the distance which the cord support 150 will move during the whipping operation to be also varied. By so doing various sizes of wires and threads may be whipped in closed or in open formation with this same mechanism.

The cord support 150 in its forward movement compresses the spring 169 and expands the spring 166. Upon the cord support 150 reaching the end of its forward stroke, the detent member 139 comes out from under the lever 106 which through pin 136 and spring 133 results in the lever 128, link 134, and lever 146 being moved upwardly about their respective pivot points to the positions as shown in Fig. 2. The lever 106 in its upward movement disconnects the clutch members 102 and 100 from the pulley 97, permitting the pulley 97 to rotate idly. The forked end 105 of the lever 106 in compressing the spring 111 forces the brake member 107, which is keyed to shaft 95, tightly against the portion of the housing denoted by the reference numeral 110 thereby braking the shaft 95 and arresting its rotation.

Meanwhile the energy stored up in the stretched spring 166 causes the cord support 150 to assume its original position, which through lever 148 draws the rack 145 back to its normal position as shown in Fig. 1. The spring 125 which helps insure a good frictional engagement between the tapered end 122 of the member 121 and the walls of the hole 123 of member 118 is compressed by the member 121 straddled by one end 126 of lever 127 due to lever 127 pivoting at point 128 and drawing the member 121 downwards.

It will be noted that the detent member 139 in engaging the lever 106 as shown in Fig. 2 prevents the spring 169 from reacting and maintains it ready for the next operation. Furthermore, by stepping on the foot pedal (not shown) the operator can move lever 131 upward to its original position, which through spring 137 is snapped back so that the shoulder 130 of lever 131 is in engagement with plate 129 on lever 127.

The operator then takes the whipped cord and removes it from the V-shaped grooves 91 and 22, drawing the wire 82 and thread

81 around the pin 14 through the retaining clip 17 and over the tapered edge 16 of cutting blade 19, severing the surplus wire 81 and thread 82 from the cord 21, leaving the mechanism ready for another cord.

What is claimed is:

1. In a mechanism for whipping a core with strand material, means for whipping the strand around the core, a support for the core, means for causing a relative movement between the support and the whipping means to cause the strand to be whipped about the core, a stationary element, and means located thereon for holding the end of the strand during the whipping operation.
2. In a mechanism for whipping a core with strand material, means for whipping a plurality of strands around the core, said means designed to whip each strand about different section of the core, a support for the core, means for causing a relative movement between the support and whipping means to cause the strands to be whipped about the core, a stationary element, means located thereon for holding the strands during the whipping operation, and for severing the surplus strands.
3. In a mechanism for whipping the end of a core, means for contemporaneously whipping a portion of the core with a textile strand and another portion of the said core with a metallic strand.
4. In a mechanism for whipping a telephone cord having an electrical conductor covered with braided insulation, means for contemporaneously whipping a portion of the braided insulation of the telephone cord with thread and the end of the exposed conductor thereof with wire.
5. In a mechanism for whipping a telephone cord having an electrical conductor covered with braided insulation, means for contemporaneously whipping a portion of the braided insulation of the telephone cord with thread, the end of the exposed conductor thereof with wire in such a manner so that the wire is wound over the end of the thread.
6. In a mechanism for whipping a core with strand material, means for revolving a supply of strand material around the axis of the core, means for withdrawing the strand material from the revolving supply and for whipping it around the core, a support for the core, means for causing a relative movement between the support and the whipping means to cause the strand to be whipped about the core, a stationary element, and means located thereon for holding the end of the strand material during the whipping operation.
7. In a mechanism for whipping the end of a core covered with braided material, a support for said core, means for contemporaneously whipping a portion of the braided covering with thread and the exposed portion of the core with wire, and means for causing a relative movement between the support and the whipping means to cause the thread and wire to be whipped about the core in spiral formation.
8. In a mechanism for whipping the end of an electrical conductor covered with braided insulation, a supply of thread revoluble about the axis of the conductor, a supply of wire, means for contemporaneously whipping a portion of the braided insulation with thread and the exposed portion of the conductor with wire, and means for causing the thread and wire to be whipped about the core in spiral formation.

In witness whereof, I hereunto subscribe my name this 29th day of July A. D., 1924.

CARL ODENWALD HAASE.