Dec. 11, 1934. L. E. POOLE 1,983,808

DISTRIBUTOR ROTOR ASSEMBLING DEVICE

Filed Oct. 15, 1932 4 Sheets-Sheet 1

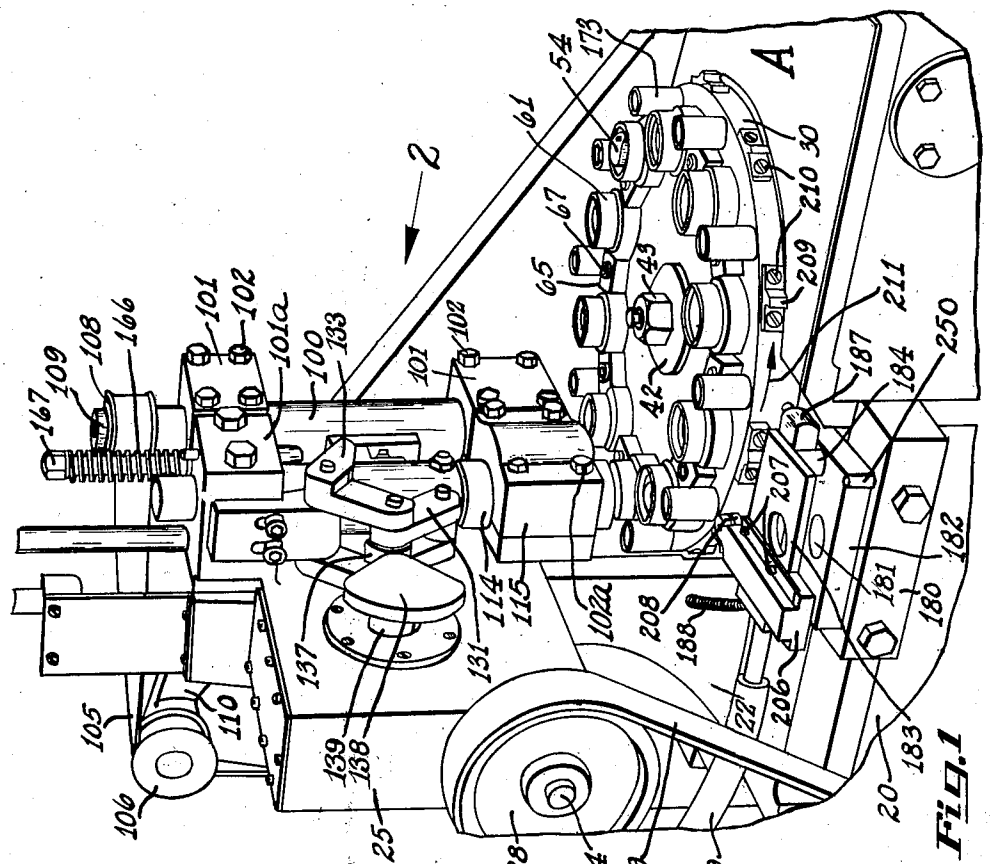

Fig. 1

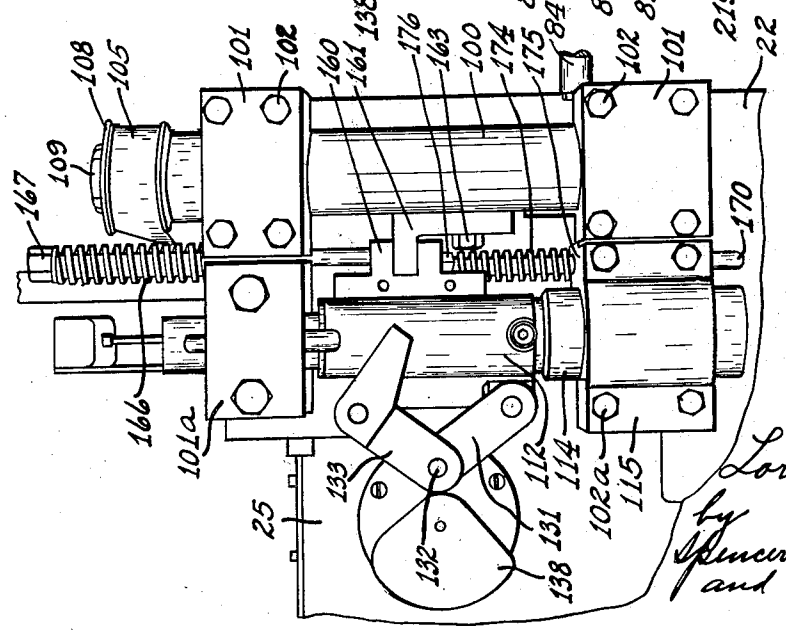

Fig. 2

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DISTRIBUTOR ROTOR ASSEMBLING DEVICE

Filed Oct. 15, 1932 4 Sheets-Sheet 2

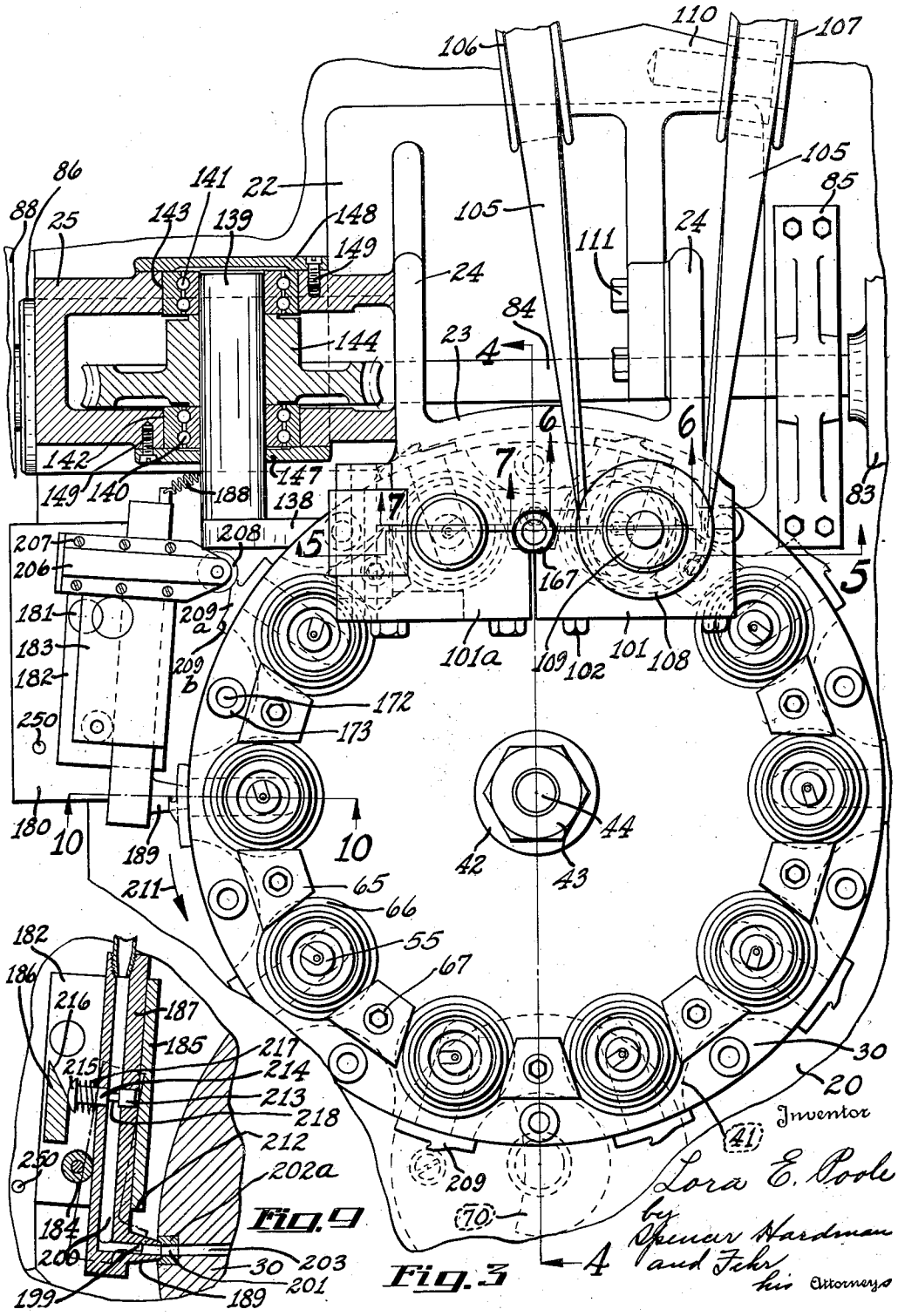

Fig. 9

Fig. 3

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DISTRIBUTOR ROTOR ASSEMBLING DEVICE

Filed Oct. 15, 1932 4 Sheets-Sheet 3

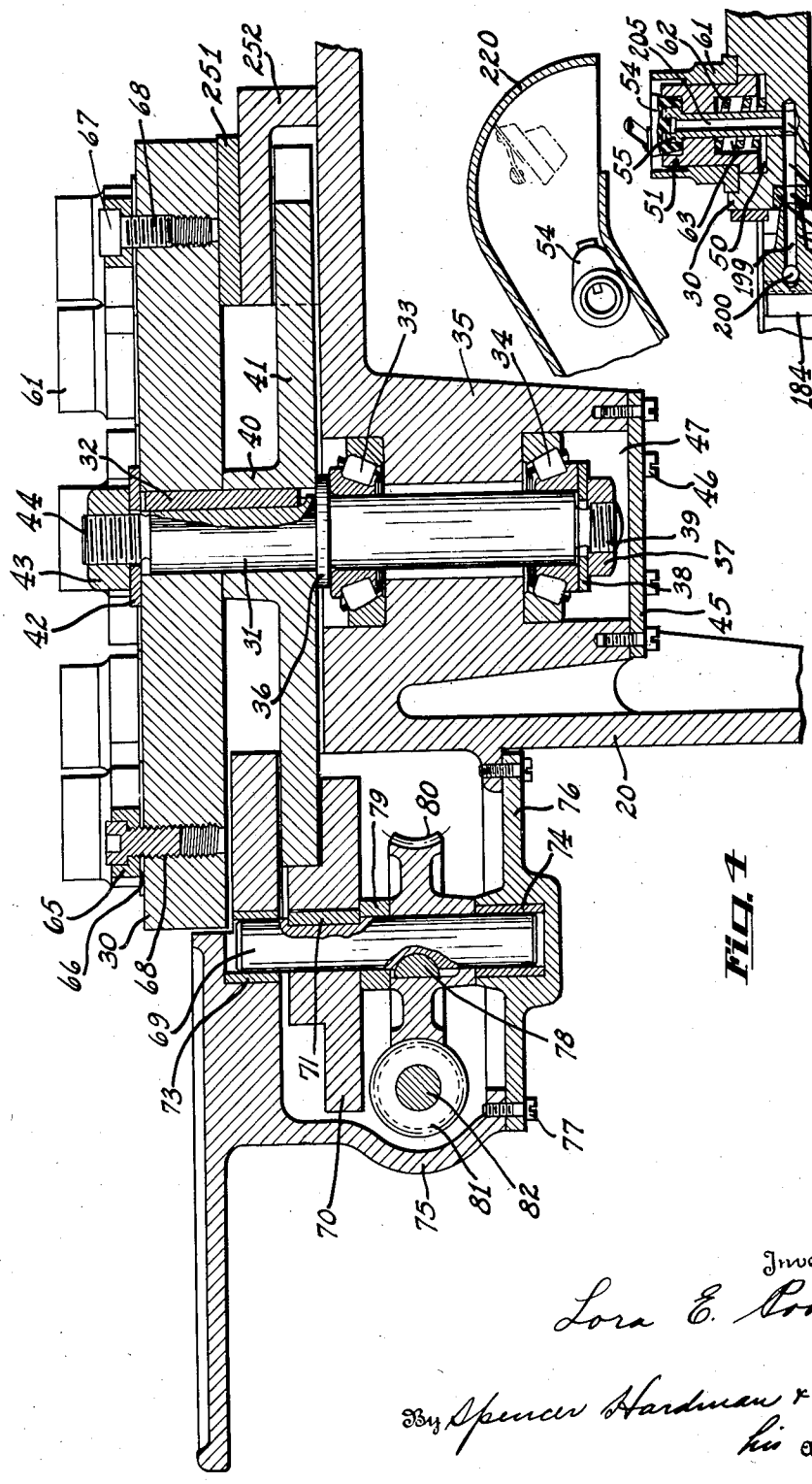

Fig. 1

Fig. 10

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DISTRIBUTOR ROTOR ASSEMBLING DEVICE

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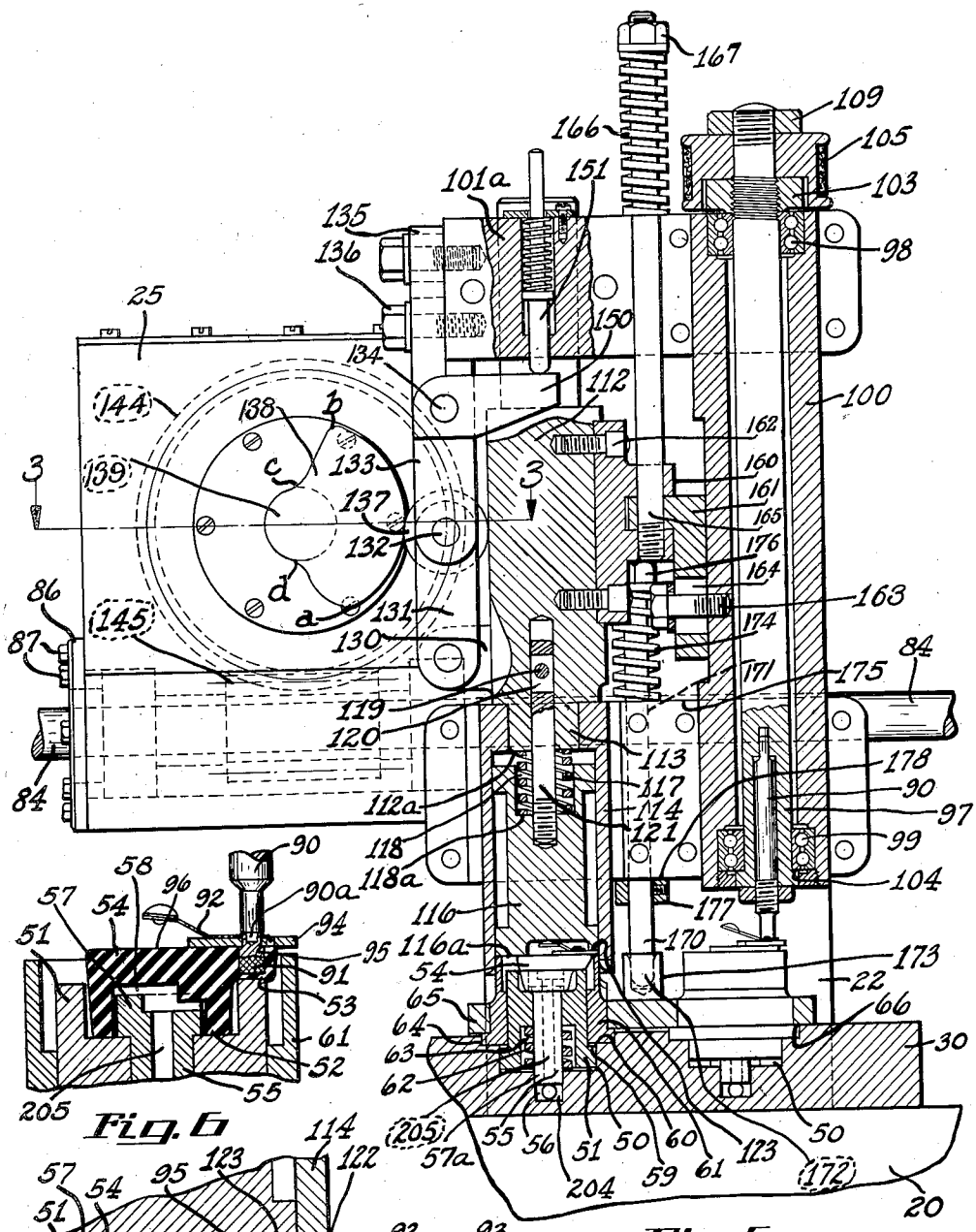

Fig. 6

Fig. 5

Fig. 7

Fig. 8

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Patented Dec. 11, 1934 1,983,808

UNITED STATES PATENT OFFICE

1,983,808

DISTRIBUTOR ROTOR ASSEMBLING DEVICE

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Application October 15, 1932, Serial No. 637,909

28 Claims. (Cl. 29—33)

This invention relates to the manufacture of distributor rotors for ignition apparatus and more particularly to rotors comprising a non-conductive block, a distributor segment and a contact for electrically connecting the segment with the contact of the distributor head.

It is among the objects of the present invention to secure a distributor segment and a contact to a distributor rotor block.

Another object of the present invention is to trim off the outer end of the rotor segment so as to space the same the required distance from any of the distributor posts past which the segment rotates.

Another object of the invention is to provide for automatically removing the assembly from the machine.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of one form of the present invention is clearly shown.

In the drawings:

Fig. 1 is a fragmentary perspective view of a machine embodying the present invention.

Fig. 2 is another fragmentary perspective view of the same looking in the direction of arrow 2, in Fig. 1.

Fig. 3 is a fragmentary top view of the machine, part of which is shown in section, the section being taken on the line 3—3 of Fig. 5.

Fig. 4 is a fragmentary sectional view taken on the line 4—4 of Fig. 3.

Fig. 5 is a sectional view taken substantially along the line 5—5 of Fig. 3.

Fig. 6 is an enlarged fragmentary sectional view taken on the line 6—6 of Fig. 3, illustrating a spinning operation.

Fig. 7 is an enlarged fragmentary sectional view taken on the line 7—7 of Fig. 3, illustrating a shearing operation.

Fig. 8 is a fragmentary sectional view of part of a rotor block showing the same, a segment and a contact in preassembled relation.

Fig. 9 is a fragmentary sectional view through the ejecting device.

Fig. 10 is a sectional view taken on the line 10—10 of Fig. 3.

Referring to the drawings the reference numeral 20 designates a table which supports a frame 22, which frame movably supports a plurality of reciprocating tools for assembling a segment and a contact with a rotor block and for shearing excessive length off the end of an assembled segment. As best shown in Fig. 3, frame 22 mainly consists of a vertically extending wall 23 reinforced by parallel ribs 24, and a casing 25. The various reciprocating tools supported by frame 22 and more particularly by its vertical wall will be described later.

With particular reference to Fig. 4 a rotary conveyor 30 is shown secured to a vertical shaft 31 by a key 32. Shaft 31 is rotatably supported by taper roller bearings 33 and 34, located in an annular boss 35 provided by table 20. Endwise movement of shaft 31 is prevented by a collar 36, integral with said shaft and engaging roller bearing 33, and a nut 37 and a washer 38, engaging the other roller bearing 34. Nut 37 is threadedly received by the reduced end 39 of shaft 31. The rotary conveyor 30 rests on the cylindrical boss 40 of a Geneva driven wheel 41 which is drivingly connected with shaft 31 by the same key 32 and rests on collar 36 of said shaft. Conveyor 30 is held to shaft 31 by a washer 42 and a nut 43 which is threaded over the reduced end 44 of shaft 31. A cover plate 45 is attached to the lower finished surface of boss 35 by screws 46 and covers aperture 47 in which the roller bearing 34 is located thereby preventing lubricant for lubricating the roller bearings to escape.

Referring more particularly to Figs. 3 to 6, inclusive, the rotary conveyor 30 is provided with a plurality of equally spaced annular recesses 50 each of which receives a distributor rotor supporting block 51 which, as shown in Fig. 6, supports the annular rim 52 and the extending arm 53 of a rotor block 54. Supporting block 51 is vertically slidable within recess 50 and relative to a work-locator 55 the stem 57*a* of which is press-fitted into an aperture 56 of the conveyor and extends through supporting block 51. Head 57 of the locator 55 fits properly into the recess 58 of a rotor block 54 and also prevents rotation of the rotor block relative to the locator. The annular shoulder 59 of each supporting block 51 is urged into engagement with the finished bottom surface 60 of a stationary shear member 61 (to be described later) by a compression spring 62 located in an annular recess 63 of supporting block 51 and bearing with one end against the bottom of said recess and with the other end against the bottom of recess 50 in the conveyor. Each shear member 61 is located in an annular recess 64 of the conveyor 30 coaxially of a supporting block 51 and held in said recess by retaining members 65 each one of which rests against a portion of an annular shoulder 66 of two consecutive shear members 61. Each retaining member 65 is held

in retaining position by socket head shoulder screws 67 which are threaded into the conveyor 30 as at 68.

In order to bring consecutive workholders into operative alignment with the various reciprocating tools, conveyor 30 is indexed by the previously mentioned Geneva driven wheel 41 which is intermittently rotated by a Geneva driving wheel 70, keyed as at 71 to a vertical stub shaft 69 which is rotatably supported in bushings 73 and 74 provided by a casing 75 and a cover plate 76 respectively. Cover plate 76 is attached to the casing 75 by screws 77, while casing 75 is mounted on table 20 in any suitable manner. Keyed to stub shaft 69 as at 78 and interposed between bushing 74 and a collar 79 resting against the Geneva wheel 70 is a worm gear 80 which meshes with a worm 81, attached in any suitable manner to a horizontal shaft 82, which shaft is rotatably supported in suitable bearings provided by the casing 75 and prevented from endwise movement in either direction by any suitable means. Mounted on the free end of shaft 82 which extends beyond the casing 75 is a pulley (not shown) which is drivingly connected through a belt (not shown) with a pulley 83 (see Fig. 3) mounted in any suitable manner on a horizontal shaft 84 which extends through both reinforcing ribs 24 and through the casing 25 and is rotatably supported by a bearing bracket 85 mounted in any suitable manner on table 20, and by another bearing bracket 86 secured by screws 87 to casing 25 and extending into said casing as best shown in Fig. 5. Secured in any suitable manner to that end of shaft 84 which extends beyond bearing bracket 86 is a pulley 88 which through a belt connection 89 is drivingly connected with an electric motor (not shown). The indexing of conveyor 30, therefore can be traced from the last mentioned motor through belt 89, pulley 88, shaft 84, pulley 83, belt (not shown), shaft 82, worm 81, worm gear 80, shaft 72, Geneva driving wheel 70, Geneva driven wheel 41, key 32, and shaft 31.

The spinning tool 90 which will now be detailedly described is adapted to spin the recessed end of an insert 91 in the extending arm 53 of a rotor block over the top surface of a contact 92 as best illustrated in Fig. 6. Insert 91 comprises a reduced portion 93 which extends through a segment 94 and an overlying contact 92. The spun head of the insert is adapted to secure contact 92 and segment 94 to the annular shoulder 95 of the insert and to the top surface 96 of a rotor block 54. Presuming that the operator of the machine has properly placed a rotor block 54 over a locator 55 and has properly preassembled the latter with a segment and a contact, the preassembly will be moved into operative alignment with the spinning tool 90 during an indexing operation of the conveyor, i. e., the insert 91 of the properly located rotor block 54 will move into axial alignment with the spinning tool 90. This spinning tool is non-rotatably supported by and located coaxially of a spindle 97 which is rotatably supported in ball bearings 98 and 99, located in a tubular housing 100 which is vertically slidable in cooperating bearing halves provided by the vertical wall 23 of frame 22 and bearing caps 101 attached to said vertical wall by bolts 102 as shown in Figs. 1 and 2. Endwise movement of spindle 97 relative to the tubular housing 100 is prevented by a nut 103 threadedly engaging the upper end of said spindle and resting against ball bearing 98, and a shoulder 104 provided by said spindle and resting against ball bearing 99.

In order to rotate spindle 97 and therewith spinning tool 90, an electric motor (not shown) which is mounted on table 20 drives an endless belt 105 which is guided over idlers 106 and 107 and passed around a pulley 108 which is drawn into frictional engagement with nut 103 by a nut 109 threadedly received by the extreme upper end of spindle 97 as shown in Fig. 5. Idlers 106 and 107 are rotatably supported by a bracket 110 which is attached to the reinforcing rib 24 by screws 111. The operating end of the spinning tool 90 is so shaped that upon movement of said tool toward the insert 91 the recessed end thereof is spun over the top surface of contact 92, and is furthermore provided with a reduced extension 90*a* which fits into the recess of the insert and prevents collapsing of the cylindrical wall of the recessed insert portion during a spinning operation.

After a contact and a segment is thus assembled with a rotor block, the latter will be indexed into operative alignment with a reciprocating shear member to be described shortly. Provided by the vertical wall 23 of frame 22 and by a bearing cap 101*a* are semi-cylindrical bearing surfaces in which a ram 112 is guided for vertical movement. The lower reduced end 113 of ram 112 receives a tubular shearing member 114 which is attached to said reduced end by a set screw (not shown). Shearing-member 114 is guided for vertical movement through bearing surfaces provided by the vertical wall 23 and another bearing cap 115 which is secured by screws 102*a* to said wall. Slidable within said shear member 114 is a pressure block 116 which is normally urged away from the bottom surface 112*a* of ram 112 by a spiral spring 117 located in a recess 118 in said pressure block and resting against said bottom surface 112*a* and the bottom surface 118*a* of recess 118. Endwise movement of pressure block 116 within shear member 114 is limited by a pin 119 mounted in ram 112 and extending through an oblong slot 120 in a rod 121 which is threaded into pressure block 116. By this arrangement the lowermost surface 116*a* of the pressure block 116 extends below the shearing edge 122 of shear member 114 when the ram 112 is in an uppermost position as shown in Fig. 2. It will be noted from Fig. 5 that the surface 123 of the pressure block 116 which engages the top surface of a segment 94 is located from the surface 116*a* a distance equal to the thickness of a segment 94 so that upon engagement of these surfaces with the segment and the top surface 96 of the rotor block respectively, the same will not be jerked sidewise but rather will be retained in properly located position. Upon downward movement of the ram 112 the pressure block 116 will first engage the assembled segment and the rotor block and move the latter together with its supporting block 51 downwardly until the segment 94 rests against the ring shaped top surface 124 of shear member 61 whereupon the rotor block and its floating support 51 come to rest. The tubular shear member 114 now approaches more quickly the segment 94 and finally shears off the end of the segment between the cutting edges of shear members 61 and 114. In order to accomplish this the segment 94 is moved by pressure block 116 into engagement with the stationary shear member 61 before the movable shear member 114 engages said segment, it will be necessary that spring 117 is under great-

er compression than spring 62 as can be readily understood.

In order to reciprocate ram 112 and the parts carried thereby, this ram is provided with a forked lug 130 which pivotally receives a link 131, which is also pivotally connected as at 132 with another link 133 which in turn is pivoted as at 134 to a bracket 135 adjustably attached to the vertical wall 23 of frame 22 by screws 136. An anti-friction roller 137 is rotatably mounted on pivot 132 and adapted to cooperate with a cam plate 138 which is integral with a shaft 139 rotatably supported in ball bearings 140 and 141 which are located in annular recesses 142 and 143 respectively, of casing 25 as can be seen in Fig. 3. Mounted on shaft 139 in any suitable manner and interposed between ball bearings 140 and 141 is a worm gear 144 which is in mesh with a worm 145 (see Fig. 5) mounted in any suitable manner on shaft 84. Ball bearings 140 and 141 are retained in engagement with worm gear 144 by cover plates 146 and 147, respectively, attached to casing 25 by screws 149. It will be seen from Fig. 5 that as long as roller 137 rides over the surface *a*—*b* of clockwise rotating cam plate 138, links 131 and 133 are substantially in axial alignment and ram 112 in substantially lowermost position. When roller 137 rides over the descent *b*—*c* of cam plate 138, ram 112 and the parts carried thereby will ascend partly under the power of spring pressed plunger 151 and additional spring urged means to be described. When roller 137 rides over the concentric portion *c*—*d* of the cam plate the ram and its parts remain in uppermost position until the roller rides over the ascent *d*—*a* of the cam plate thereby causing the ram and the parts carried thereby to descend and perform a shearing operation in the manner explained earlier. In order to move the links 131 and 133 out of axial alignment as shown in Fig. 5, an arm 150, rotatable about pivot 134 and drivingly connected with link 133 is urged in clockwise direction by a spring pressed plunger 151 thus tending to turn link 133 clockwise about pivot 134.

Tubular housing 100 is reciprocated in unison with the ram 112 by means of interlocking brackets 160 and 161, mounted on the ram 112 by screws 162, and on the tubular housing 100 by a screw 163 respectively. Screw 163 passes through an oblong slot 164 of bracket 161 and thus allows for vertical adjustment of said bracket relative to the housing. Secured to brackets 160 and 161 is a vertical bar 165 which extends between the bearing caps 101 and 101*a*. Surrounding that end of bar 165 which extends beyond these bearing caps is a spring 166 bearing with one end against the top surfaces of bearing caps 101 and 101*a* and with the other end against a nut 167 which is threaded over the extreme upper end of bar 165. Spring 166 is held under compression and is adapted to cooperate with spring pressed plunger 151 to raise ram 112 and housing 100 whenever cam plate 138 permits.

The considerable downward thrust caused by the concurrent spinning and shearing operations and transmitted to the conveyor 30 is taken up by a wear plate 251 supported by a bracket 252 which is mounted in any suitable manner on the table 20 as best shown in Fig. 4. In this manner the roller bearing support of the conveyor shaft 31 is effectively protected against eccentric thrust.

In order properly to align consecutive workholders with the spinning tool 90 and the shear member 114, a pilot pin 170 extends through a guiding hole 171 in the vertical wall 23 of frame 22, whose lower end is adapted to register with the aperture 172 of one of a plurality of locating blocks 173 which are carried by the conveyor 30. There is one locating block 173 provided for each pair of consecutive work-holders. Pilot pin 170 is normally urged into uppermost position by a compression spring 174 surrounding said pilot pin and bearing with one end against a shoulder 175 of the vertical wall 23 and with the other end against the hexagonal head 176 of the pilot pin. A collar 177 adjustably mounted on the pilot pin 170 and resting against the lowermost surface 178 of the vertical wall 23 determines the uppermost position of said pilot pin. Spring 174 is held under compression so as to maintain pilot pin 170 in uppermost position. Collar 177 is so adjusted on the pilot pin that the lowermost end of the latter projects beyond the lowermost surfaces of pressure block 116 in uppermost position so that upon downward travel of the reciprocating tools said pilot pin first registers with an aligned locating block 173 and properly aligns consecutive workholders with said reciprocating tools before the latter operatively engage the properly located work. This additional locating of the workholders by the pilot pin 170 and a cooperating locating block 173 is necessary in view of the unavoidable lost motion in the Geneva drive of the conveyor.

Referring more particularly to Figs. 1, 3, 9 and 10 there is shown a device for ejecting an assembled rotor block during an intermittent rotation of the conveyor. Mounted in any suitable manner on table 20 is a supporting plate 180 on which is pivotally mounted as at 181 another plate 182. A third plate 183 is held spaced from plate 182 by a roller 184, a guiding ledge 185 and a projecting lug 186, the latter two of which are integral with plate 182. Slidable along the guiding ledge 185 and between plates 182 and 183 is a valve body 187, which is held in engagement with said guiding ledge by roller 184 and by a tension spring 188 having one end connected to the valve body and the other end to the vertical wall 23 of frame 22; this spring 188 also has a tendency to rock valve body 187 and therewith plates 182 and 183 in a clockwise direction about the pivot 181 as viewed in Figs. 1 and 9. Valve body 187 terminates into a nozzle 189 having a duct 199 which communicates with the duct 200 of the valve body and is adapted to communicate with an adjacent duct 201 in one of a plurality of bushings 202 let in the peripheral surface of the conveyor. Each of these ducts 201 communicates with a duct 203 in the conveyor which communicates with a chamber 204 formed by recess 56 below the stem 57*a* of the locator 55. Locator stem 57*a* is provided with a longitudinal duct 205 which terminates into the recess 58 of a properly located and assembled rotor block 54. Spring 188 normally maintains valve body 187 and plates 182 and 183 in such position that nozzle 189 is withdrawn from a bushing 202 and hence out of communication with the duct of the bushing. In order to approach nozzle 189 to the bushing, a bar 206 is adjustably mounted on top of plate 183 by screws 207, which bar carries an anti-friction roller 208, adapted to cooperate with a plurality of equally spaced cam lugs 209 mounted by screws 210 on the periphery of the conveyor 30. It will be observed in Fig. 1 that the roller carrying bar 206 is eccentrically located with respect to the center of rotation of plates 182 and 183 for a reason to be explained presently. Cam lug 209*a* is adapted

upon rotation of the conveyor in the direction of arrow 211 in Fig. 3 to move roller carrying bar 206 away from the periphery of the conveyor thereby rotating plates 182 and 183 and therewith valve body 187 counterclockwise as viewed in Figs. 3 and 9, so that the nozzle 189 approaches and finally slightly projects into the now aligned duct 201 of the moving bushing 202*a*. Proper locating of the cam lug 209*a* with respect to the bushing 202*a* is essential to accomplish that the nozzle 189 and the bushing 202*a* move concurrently into alignment. Upon continued movement of the conveyor in the direction of arrow 211 in Figs. 1 and 3, cam lug 209*a* maintains the nozzle 189 in engagement with bushing 202*a* for a short period during which valve body 187 will move in unison with the conveyor through the driving connection between nozzle 187 and bushing 202*a* illustrated in Fig. 9. Normally valve body 187 is maintained in the dot and dash position shown in Fig. 9 relative to the supporting plate 182 due to the tension of spring 188 which causes the nozzle to engage with the surface 212 of the guiding ledge 185. In this position of the valve body the duct 200 is intercepted by the cylindrical portion 213 of a valve 214 having a curved head 215 urged into engagement with a cam surface 216 of the extending lug 186 by a spring 217. Upon movement of the valve body 187 from the dot and dash position into the full line position shown in Fig. 9, valve 214 will move into the position shown in full lines in Fig. 9 due to the shape of the cam surface 216 in which position a reduced portion 218 of valve 214 projects into duct 200 whereby a free passage of compressed air is provided in the duct 200. Duct 200 communicates with a supply of compressed air (not shown) through a hose 219 and in the full line position of valve body 187 in Fig. 9 compressed air is permitted to pass through ducts 200, 199, 201 and 203 into the chamber 204 and from there through duct 205 below an assembled and properly located rotor block 54, whereupon the same is blown from its workholder into a suitable chute 220 from where it glides to any suitable place. By this time cam lug 209*a* has cleared the roller 208 whereupon spring 188 is free to withdraw the nozzle 189 from engagement with bushing 202*a* and then to move the valve body 187 from the full line position to the dot and dash position in Fig. 9 as earlier explained. During such movement of the valve body head 215 of valve 214 rides over the cam surface 216 and causes the cylindrical portion of the valve to shift into duct 200 and intercept the free passage of compressed air through that duct. A stop pin 250 carried by plate 180 limits the approach of roller 208 toward the periphery of the conveyor so that this roller never moves below the surface 209*b* of cam lug 209.

As will appear from the foregoing description of the machine, the same is entirely automatic in its operation, the operator of the machine merely has to load the workholders with rotor blocks while passing position A shown in Fig. 1 and then preassemble a segment and a contact with each one of the located rotor blocks.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein comprising, in combination, a workholder floatingly mounted for properly locating a rotor; a rotatable tool for spinning the free end of the insert extending through the contact and segment upon relative movement between said tool and the rotor; and means for effecting relative movement between the tool and the rotor.

2. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein comprising, in combination, a workholder comprising a rotor locator and a floating rotor support, said locator permitting linear movement of the rotor in properly located position; a rotatable tool for spinning the free end of the insert extending through the contact and segment upon relative movement between the rotor and said tool; and means for effecting relative movement between the tool and the rotor support.

3. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein comprising, in combination, a floatingly mounted workholder for properly locating a rotor; a rotatable tool for spinning the free end of the insert extending through the contact and segment upon movement of said tool relative to the rotor; and means for reciprocating the tool toward and away from the rotor.

4. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein comprising, in combination, a workholder comprising a rotor locator and a floating rotor support, said locator permitting linear movement of the rotor in properly located position; a rotatable tool for spinning the free end of the insert extending through the contact and segment upon movement of said tool relative to the rotor; and means for reciprocating the tool toward and away from the rotor.

5. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein comprising, in combination, a workholder for properly locating a rotor; means for spinning the free end of the insert extending through the contact and segment upon relative movement between said means and the rotor; means for effecting relative movement between the spinning means and the rotor; and means operative in response to relative movement between the spinning means and the rotor for ejecting an assembled rotor from the workholder.

6. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein comprising in combination, a workholder for properly locating a rotor; a tool for spinning the free end of the insert extending through the contact and segment upon relative movement between said tool and the rotor; means for effecting relative movement between the tool and the rotor, a supply of compressed air; normally closed means communicating with the air supply; and means actuated in response to relative movement between the tool and the rotor for opening the last said means whereby a blast of compressed air is discharged which blows the assembled distributor rotor from the workholder.

7. A machine for shearing excessive length off the end of an assembled distributor rotor segment comprising, in combination, a workholder having a cylindrical periphery and adapted non-rotatably to support a rotor with its axis of rotation coaxial of the axis of the periphery of the workholder; a stationary shear member journaled about the periphery of the workholder and hav-

ing a shearing edge which is curved concentrically of the periphery of the workholder; means for urging the rotor segment into engagement with the stationary shear member; a reciprocable shear element adapted to cooperate with the stationary shear member for performing a shearing operation; means for reciprocating the shear element toward and away from the shear member; and means operative in response to operation of the reciprocating means for ejecting the finished rotor from the workholder.

8. A machine for shearing excessive length off the end of an assembled distributor rotor segment comprising in combination, a workholder for properly locating a rotor; a stationary shear member so coordinated with the workholder that the segment of a properly located rotor is in operative alignment with said shear member; a reciprocable shear element adapted to cooperate with the stationary shear member for performing a shearing operation; means for reciprocating the shear element toward and away from the shear member; a supply of compresed air; normally closed means communicating with the air supply; and means actuated in response to operation of the reciprocating means for opening the normally closed means whereby a blast of compressed air is discharged which blows the finished distributor rotor from the workholder.

9. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment comprising, in combination, a rotary conveyor; a plurality of equiangularly spaced workholders floatingly carried by the conveyor each for properly locating a rotor; means for indexing the conveyor; means for spinning the free end of an insert extending through the contact and segment of a rotor in an aligned workholder during an intermittent rest period of the conveyor; cooperating shear members one being movable relative to the other to perform a shearing operation upon an assembled segment during the same intermittent rest period of the conveyor; means for moving said one shear member relative to the other; and means for urging said assembled segment into engagement with said other shear member prior to the shearing operation.

10. A machine for assembling a contact member and a segment member with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment member comprising, in combination, a rotary conveyor; a plurality of equiangularly spaced workholders floatingly carried by the conveyor, each having a cylindrical periphery and adapted non-rotatably to support a rotor with its axis of rotation coaxial of the axis of the periphery of the workholder; means for indexing the conveyor; a rotating tool for spinning the free end of an insert extending through both members upon relative movement between said tool and an aligned rotor during an intermittent rest-period of the conveyor, means actuated in response to the operation of conveyor indexing means for effecting relative movement between the spinning tool and said aligned rotor; shear members carried by the conveyor, each being journaled about the periphery of a workholder and having a shearing edge which is curved concentrically of the periphery of the workholder; a single shear member cooperating with an aligned shear member on the conveyor to perform a shearing operation upon movement of the single shear member relative to the cooperating shear member during the same intermittent rest period of the conveyor; means actuated in response to relative movement betwen the spinning tool and a rotor for moving said single shear member relative to the cooperating shear member; and means carried by the movable shear member for urging said assembled segment member into engagement with said other shear member prior to the shearing operation.

11. A machine for assembling a contact member and a segment member with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment member comprising, in combination, a rotary conveyor; a plurality of spaced workholders floatingly carried by the conveyor, each having a cylindrical periphery and adapted non-rotatably to support a rotor with its axis of rotation coaxial of the axis of the periphery of the conveyor; means for indexing the conveyor; a rotating tool for spinning the free end of an insert extending through both members upon movement of said tool relative to an aligned rotor during an intermittent rest period of the conveyor; shear members carried by the conveyor, each being journaled about the periphery of a workholder and having a shearing edge which is curved concentrically of the periphery of the workholder; a single shear member cooperating with an aligned shear member on the conveyor to perform a shearing operation upon movement of the single shear member relative to the cooperating shear member during the same intermittent rest period of the conveyor; means actuated in response to operation of the indexing means for moving the spinning tool and the single shear member; and means carried by the movable shear member for urging an assembled segment member into engagement with a shear member on the conveyor prior to the shearing operation.

12. A machine for assembling a contact member and a segment member with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment member comprising, in combination, a rotary conveyor; a plurality of equiangularly spaced workholders floatingly carried by the conveyor, each having a cylindrical periphery and adapted non-rotatably to support a rotor with its axis of rotation coaxial of the axis of the periphery of the workholder; means for indexing the conveyor; a rotating tool for spinning the free end of an insert extending through both members upon relative movement between said tool and an aligned rotor during an intermittent rest-period of the conveyor; means actuated in response to operation of the conveyor indexing means for effecting relative movement between the spinning tool and said aligned rotor; shear members carried by the conveyor, each being journaled about the periphery of a workholder and having a shearing edge which is curved concentrically of the periphery of the workholder; a single shear member cooperating with an aligned shear member on the conveyor to perform a shearing operation upon relative movement between said single shear member and the cooperating shear member during the same intermittent rest period of the conveyor; means actuated in response to relative movement between the spinning tool and a rotor for effecting relative movement between said single shear member and the cooperating shear member; and means carried by the movable shear member for

urging the assembled segment member into engagement with the other shear member prior to the shearing operation.

13. A machine for assembling a contact member and a segment member with a distributor rotor by means of an insert therein and for shearing off excessive length of the assembled segment member comprising, in combination, a rotary conveyor; a plurality of equiangularly spaced workholders floatingly carried by the conveyor each for properly locating a rotor; means for indexing the conveyor; a rotating tool for spinning the free end of an insert extending through both members upon relative movement between said tool and an aligned rotor during an intermittent rest period of the conveyor; means actuated in response to operation of the conveyor indexing means for effecting relative movement between the spinning tool and said rotor; cooperating shear members one being movable relative to the other to perform a shearing operation upon an assembled segment member during the same intermittent rest period of the conveyor; means actuated in response to relative movement between the spinning tool and a rotor for moving said one shear member relative to the other; means yieldingly carried by the movable shear member for urging said assembled segment member into engagement with said other shear member prior to the shearing operation; means for ejecting a finished rotor from its workholder; and means actuated in response to operation of the indexing means for actuating the ejecting means.

14. A machine for assembling a contact member and a segment member with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment member comprising, in combination, a rotary conveyor; a plurality of equiangularly spaced workholders floatingly carried by the conveyor each for properly locating a rotor; mechanical power means; means actuated by said power means for indexing the conveyor; a rotating tool for spinning the free end of an insert extending through both members upon relative movement between said tool and an aligned rotor during an intermittent rest period of the conveyor; means actuated in response to operation of the indexing means for effecting relative movement between the spinning tool and said rotor; cooperating shear members one being movable relative to the other in response to relative movement between the spinning tool and a rotor to perform a shearing operation upon an assembled segment member during the same intermittent rest period of the conveyor; means yieldingly carried by the movable shear member for urging said assembled segment member into engagement with said other shear member prior to the shearing operation; and means actuated in response to operation of the indexing means for ejecting a finished rotor from its workholder.

15. A machine for assembling a contact member and a segment member with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment member comprising, in combination, a rotary conveyor; a plurality of equiangularly spaced workholders carried by the conveyor each for properly locating a rotor; mechanical power means; means actuated by said mechanical power means for indexing the conveyor; a rotating tool for spinning the free end of an insert extending through both members upon movement of said tool relative to an aligned rotor while in intermittent resting position; means actuated in response to operation of the indexing means for moving the spinning tool relative to said rotor; cooperating shear members one being movable in unison with the spinning tool relative to the other shear member to perform a shearing operation upon an assembled segment member while in another intermittent resting position; means yieldingly carried by the movable shear member for urging said assembled segment member into engagement with said other shear member prior to the shearing operation and for retaining the rotor within its workholder; and means actuated in response to operation of the indexing means for ejecting a finished rotor from its workholder.

16. A machine for assembling a contact member and a segment member with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment member comprising, in combination, a rotary conveyor; a plurality of workholders carried by the conveyor each for properly locating a rotor, each of said workholders being provided with a duct leading underneath a properly located rotor; means for indexing the conveyor; a rotating tool for spinning the free end of an insert extending through both members upon relative movement between said tool and an aligned rotor while in an intermittent resting position; means for effecting relative movement between the spinning tool and said rotor; cooperating shearing members, one being movable relative to the other to perform a shearing operation upon an assembled segment member in another intermittent resting position; means for moving said one shearing member relative to the other; means for urging said assembled segment member into engagement with said other shearing member prior to the shearing operation and for retaining the rotor within its workholder; a supply of compressed air; a normally yieldingly retracted and closed valve communicating with the air supply; means on the conveyor for drivingly connecting the valve with the conveyor upon engagement of the valve with said driving connecting means; means carried by the conveyor and cooperating with the valve for moving the same into engagement with the driving connecting means on the conveyor; and stationary means for opening the valve upon movement of the same in unison with the conveyor whereby a blast of compressed air is discharged into the duct of a workholder and against an assembled rotor therein thereby blowing the latter from the workholder.

17. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein comprising in combination, a workholder for properly locating a rotor, said workholder being provided with a duct terminating within the workholder and adjacent a rotor located therein and adapted to conduct a blast of compressed air from the outside of the workholder against a rotor therein for ejecting the same from the workholder; and means for spinning the free end of the insert extending through the contact and segment.

18. A machine for shearing excessive length off the end of an assembled distributor rotor segment comprising, in combination, a workholder for properly locating a rotor; a stationary shear member so coordinated with the workholder that the segment of a properly located rotor is in operative alignment with said shear member; a reciprocable shear element adapted

to cooperate with the shear member; means for reciprocating the shear element; and means operative in response to operation of the reciprocating means for ejecting the finished rotor from the workholder.

19. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment comprising, in combination, an intermittently rotatable conveyor; a plurality of workholders carried by said conveyor; means located at a station of the conveyor for spinning the free end of an insert extending through the contact and segment of a rotor in an aligned workholder; shear members carried by the conveyor adjacent each workholder; and a reciprocable shear member located at another station of the conveyor and adapted to cooperate with an aligned shear member on the conveyor for shearing excessive length off an assembled segment.

20. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment comprising, in combination, an intermittently rotatable conveyor; a plurality of workholders carried by said conveyor; reciprocable means located at a station of the conveyor and adapted to spin the free end of an insert extending through the contact and segment of a rotor in an aligned workholder; shear members carried by the conveyor adjacent each workholder; a reciprocable shear member located at another station of the conveyor and adapted to cooperate with an aligned shear member on the conveyor for shearing excessive length off an assembled segment; and means for simultaneously reciprocating the spinning means and the reciprocable shear member.

21. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment comprising, in combination, an intermittently rotatable conveyor; a plurality of workholders carried by the conveyor; a rotatable and reciprocable tool element located at a station of the conveyor and adapted to spin the free end of an insert extending through the contact and segment of a rotor in an aligned workholder; shear members carried by the conveyor adjacent each workholder; a reciprocable shear element located at another station of the conveyor and adapted to cooperate with an aligned shear member on the conveyor for shearing excessive length off an assembled segment; means connecting both elements for unitary reciprocation; and means for reciprocating one of the elements.

22. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment comprising, in combination, an intermittently rotatable conveyor; a plurality of workholders floatingly carried by the conveyor; a rotatable and reciprocable tool located at a station of the conveyor and adapted to spin the free end of an insert extending through the contact and segment of a rotor in an aligned workholder; shear members carried by the conveyor adjacent each workholder; and a reciprocable shear member located at another station of the conveyor and adapted to cooperate with an aligned shear member on the conveyor for shearing excessive length off an assembled segment, said shear member carrying means yieldingly urging an aligned workholder to float until the segment of the rotor therein bears against the adjacent shear member on the conveyor prior to a cooperation between both shear members.

23. A machine for assembling a contact and a segment with a distributor rotor by means of an insert therein and for shearing excessive length off the assembled segment comprising, in combination, an intermittently rotatable conveyor; a plurality of workholders floatingly carried by the conveyor; a rotatable and reciprocable tool located at a station of the conveyor and adapted to spin the free end of an insert extending through the contact and segment of a rotor in an aligned workholder; shear members carried by the conveyor adjacent each workholder; a reciprocable shear member located at another station of the conveyor and adapted to cooperate with an aligned shear member on the conveyor for shearing excessive length off an assembled segment, said shear member carrying means yieldingly urging an aligned workholder to float until the segment of the rotor therein bears against the adjacent shear member on the conveyor prior to a cooperation between both shear members; and means for simultaneously reciprocating the tool and reciprocable shear member.

24. In a machine of the character described, the combination of a rotary conveyor being provided with a plurality of ducts; a plurality of workholders carried by the conveyor and each being provided with a duct communicating with a conveyor duct; a supply of fluid pressure; a normally closed valve communicating with the fluid pressure supply and being rotatable and bodily movable; means responsive to rotation of the conveyor through a predetermined cycle for rocking the valve into communication and driving engagement with a conveyor duct; and means responsive to unitary movement of the valve and conveyor through a predetermined cycle for opening said valve whereby fluid pressure discharged into said conveyor duct blows the work from the respective workholder.

25. In a machine of the character described, the combination of a rotary conveyor being provided with a plurality of ducts; a plurality of workholders carried by the conveyor and each being provided with a duct communicating with a conveyor duct; a supply of fluid pressure; a pivotally mounted plate; a valve mounted on said plate for linear movement relative thereto, said valve communicating with the fluid pressure supply and being normally close; means responsive to rotation of the conveyor through a preassigned cycle for rocking the plate until the valve communicates with and drivingly engages a conveyor duct; and means responsive to unitary movement of the valve and conveyor through a pre-assigned cycle for opening the valve whereby fluid pressure discharged into said conveyor duct blows the work from the respective workholder.

26. In a machine of the character described, the combination of a rotary conveyor being provided with a plurality of ducts; a plurality of workholders carried by the conveyor and each being provided with a duct communicating with a conveyor duct; a supply of fluid pressure; a pivotally mounted plate; a valve mounted on said plate for linear movement relative thereto, said valve communicating with the fluid pressure supply and being normally closed; means responsive to rotation of the conveyor through a preassigned cycle for rocking the plate until the valve communicates with and drivingly engages

a conveyor duct; and a cam on the plate for opening the valve upon unitary movement of the valve and conveyor through a preassigned cycle whereby fluid pressure discharged into said conveyor duct blows the work from the respective workholder.

27. In a machine of the character described, the combination of a rotary conveyor being provided with a plurality of ducts; a plurality of workholders carried by the conveyor and each being provided with a duct communicating with a conveyor duct; a supply of fluid pressure; a pivotally mounted plate; a valve mounted on said plate for linear movement relative thereto, said valve communicating with the fluid pressure supply and being normally closed; cam lugs on the conveyor for rocking the plate until the valve communicates with and drivingly engages a conveyor duct; and means responsive to unitary movement of the valve and conveyor through a preassigned cycle for opening the valve whereby fluid pressure discharged into said conveyor duct blows the work from the respective workholder.

28. In a machine of the character described, the combination of a rotary conveyor being provided with a plurality of ducts; a plurality of workholders carried by the conveyor and each being provided with a duct communicating with a conveyor duct; a supply of fluid pressure; a pivotally mounted plate; a valve mounted on said plate for linear movement relative thereto, said valve communicating with the fluid pressure supply and being normally closed; cam lugs on the conveyor for rocking the plate until the valve communicates with and drivingly engages a conveyor duct; and a cam on the plate for opening the valve upon unitary movement of the valve and conveyor through a preassigned cycle whereby fluid pressure discharged into said conveyor duct blows the work from the respective workholder.

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