April 19, 1949. T. T. LOGIE ET AL 2,467,897

CONDENSER WINDER

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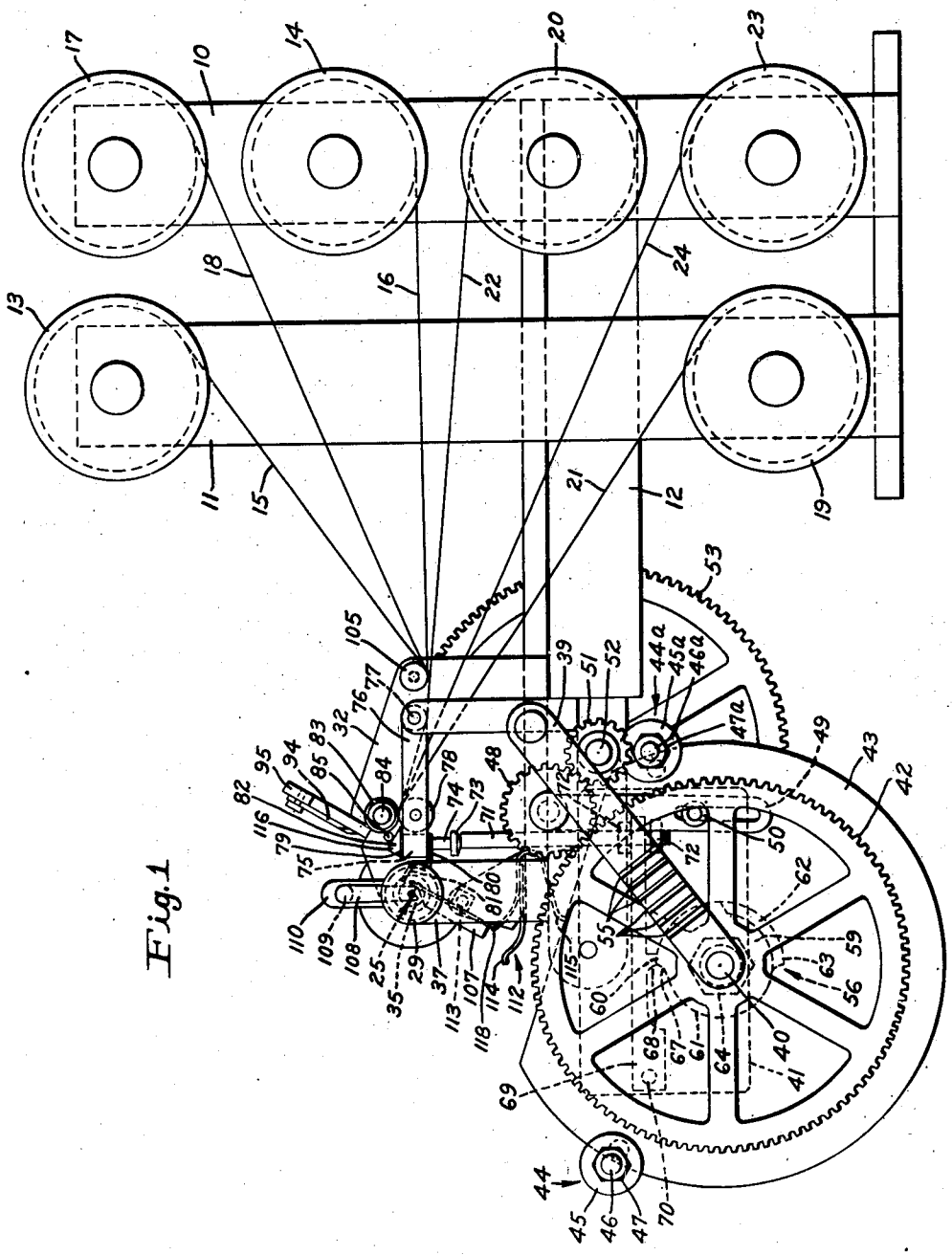


Fig. 1

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CONDENSER WINDER

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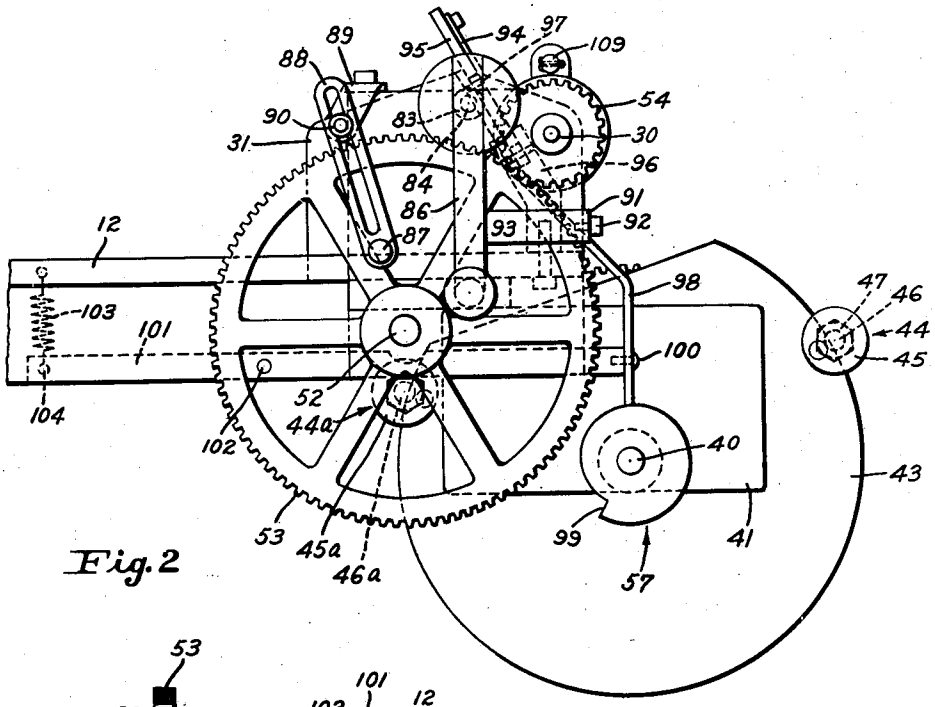


Fig. 2

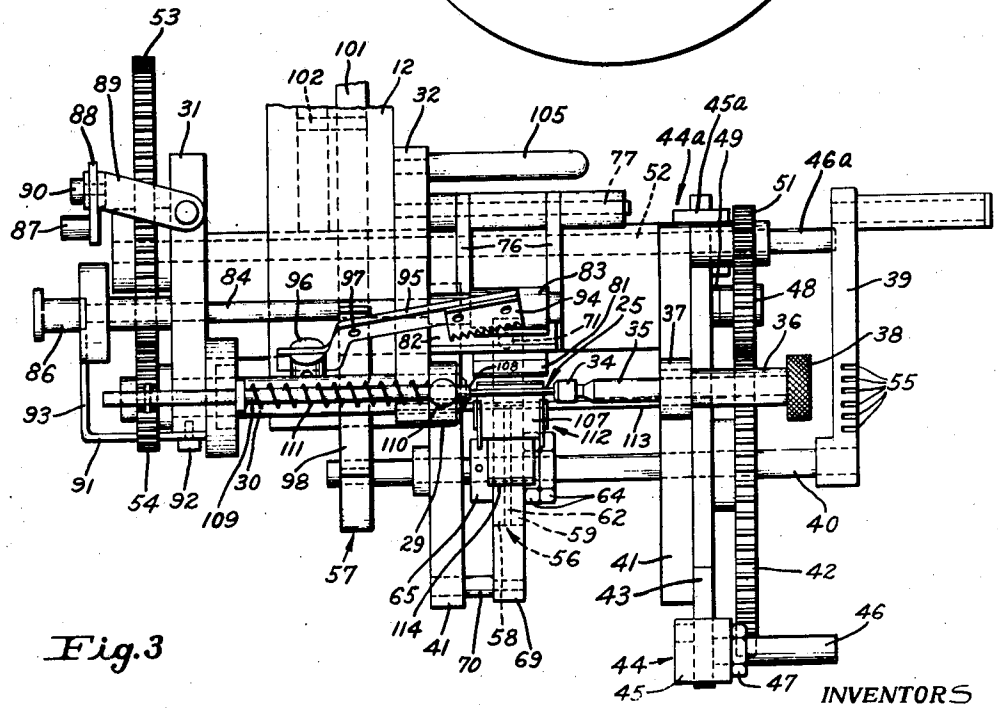


Fig. 3

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CONDENSER WINDER

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Fig. 4.

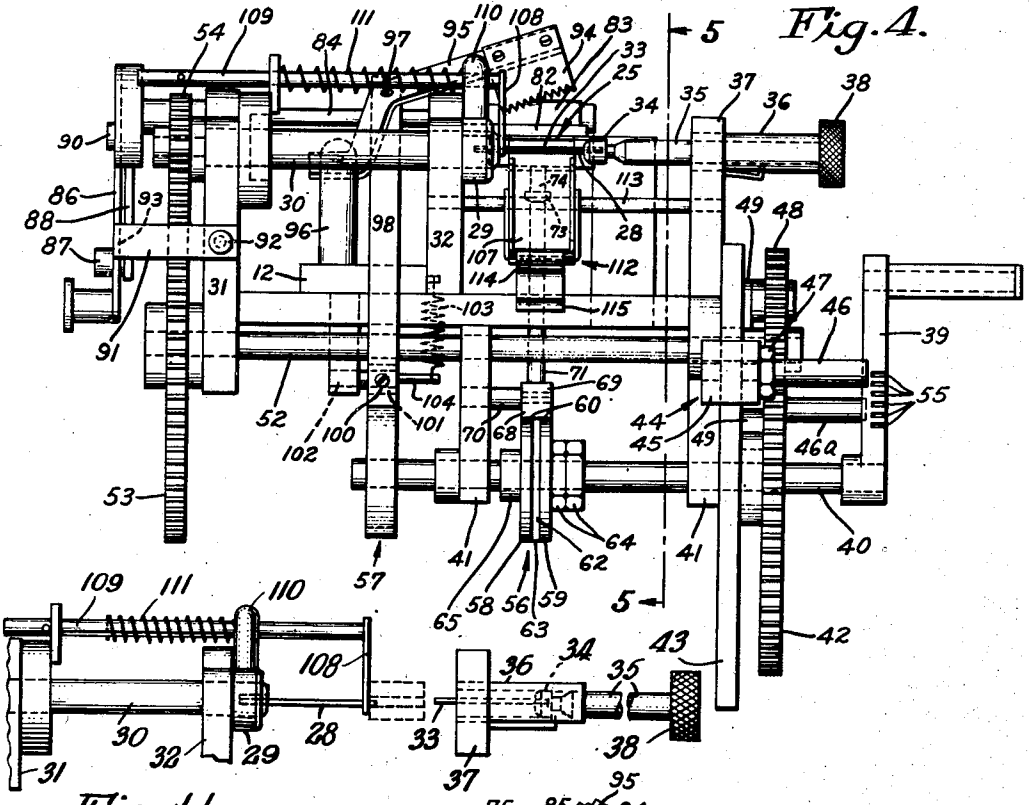


Fig. 11.

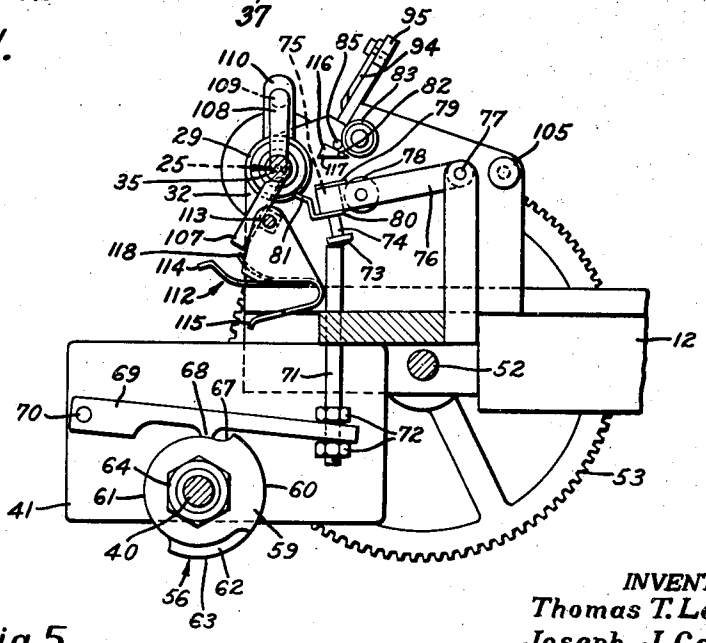


Fig. 5

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CONDENSER WINDER

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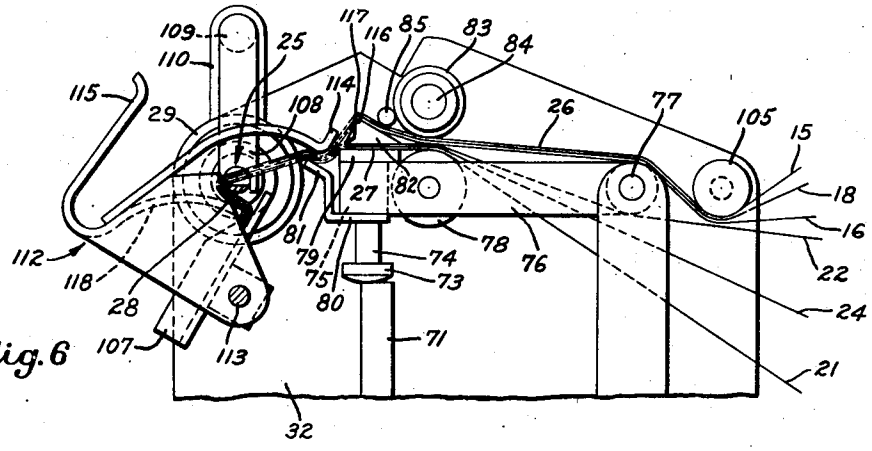


Fig. 6

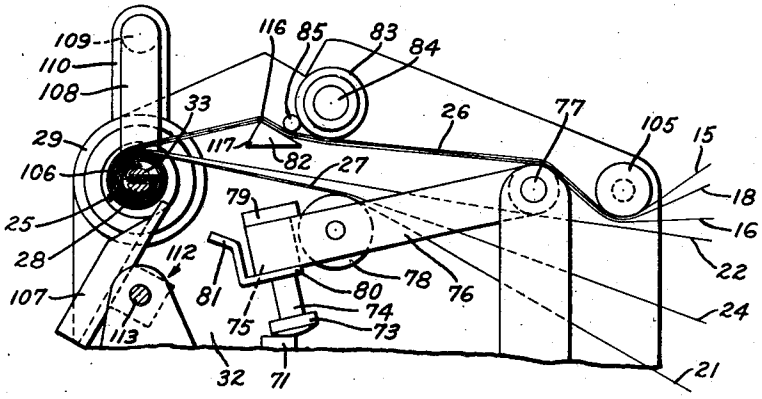


Fig. 7

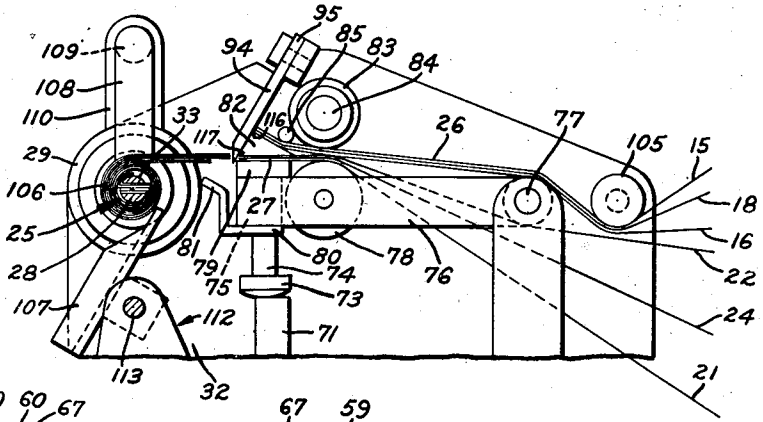
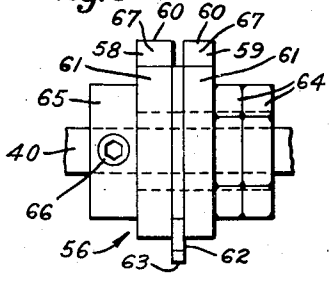


Fig. 8

Fig. 9



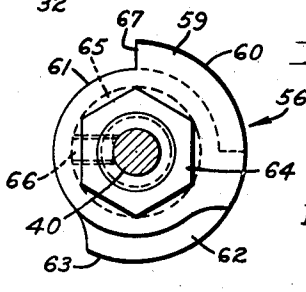


Fig. 10

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UNITED STATES PATENT OFFICE

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CONDENSER WINDER

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Application July 6, 1945, Serial No. 603,558

15 Claims. (Cl. 242—56)

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This invention relates to new and useful improvements in condenser winding machines.

The primary object of the invention is to provide a machine for the rapid production of condensers.

Other objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a side elevational view of the machine of the invention;

Fig. 2 is a side elevational view of the operating means of the machine, the view being of that side of the machine opposite to that shown in Fig. 1;

Fig. 3 is a top plan view of that part of the machine shown in Fig. 2;

Fig. 4 is a front elevational view of the mechanism of Fig. 3;

Fig. 5 is a sectional view along the line 5—5 of Fig. 4;

Fig. 6 is a detail sectional view on an enlarged scale illustrating a step in the operation of making a condenser;

Fig. 7 is a view similar to Fig. 6 but showing a subsequent position of the parts;

Fig. 8 is a similar view showing the relation of the parts as the condenser is cut from the strips of stock;

Fig. 9 is an enlarged front elevational view of a cam employed;

Fig. 10 is a side elevational view of said cam; and

Fig. 11 is a detail elevational view showing the parts of the arbor separated and showing the ejector or stripper means in an advanced position.

Referring in detail to the drawings, the complete machine, shown in Fig. 1, comprises a frame including uprights 10 and 11 and a forwardly extending horizontal member 12. The actual mechanisms, having to do with winding of the condensers, are mounted either directly or indirectly on the forward portion of the horizontal arm 12 while the uprights 10 and 11 provide for the mounting of reels carrying the strip stock from which the condensers are to be wound.

Of the six reels shown, those numbered 13 and 14 carry strips of insulating material, as the paper

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strips 15 and 16, while reel 17 carries metal foil 18. This arrangement is substantially duplicated at the lower portion of the uprights where reels 19 and 20 carry strips of insulating material, as the paper strips 21 and 22, while reel 23 carries a strip of metal foil 24. It will be noted that the paper strips 15 and 16 together with the foil 18 provide a laminated structure of which the foil in an intermediate layer while the strips 21, 22 and 24 provide a second laminated structure of which the metal foil strip 24 is the intermediate layer.

The two described laminated structures are wound one within the other about an arbor 25 and, for the purpose of later convenience in the description, the respective laminated structures are designated 26 and 27. Arbor 25 is of a split construction or is of a longitudinal divided construction comprising a part 28 held in a chuck or collet 29 at the inner end of a shaft 30, which latter is mounted in suitable supports or frame plates 31 and 32 and driven as will be described.

The other part of arbor 25 is designated 33 and is mounted in a chuck or head portion 34 carried by a shaft 35 turnable and slidable in a sleeve 36 mounted by a support 37. A knob 38 on the outer end of shaft 35 provides means whereby the said shaft and the arbor part 33 may be drawn outwardly to move such arbor part longitudinally of the arbor part 28 to take such parts out of overlapping relation. Thereafter, shaft 35 may be given a reverse movement to bring the arbor parts back into overlapping relation. The purpose of this arrangement will later be described.

Arbor 25 is driven by crank 39 through suitable intermediate gears and shafts. Such crank is fixed to the end of the shaft 40 having bearing in the frame parts 41 and mounting a relatively large gear 42. Also disposed about the said shaft and fixed to the frame of the machine is a plate 43 having an arcuate outer edge about which stop devices 44 and 44a may be adjusted. Such devices comprise blocks 45 and 45a each having a groove receiving the edge portion of the plate 43 and mounting stop pins 46 and 46a respectively. Nuts 47 and 47a provide means for locking the respective stop devices in their various positions of adjustments. Pins 46 and 46a project laterally of the plate 43 in parallel relation with the shaft 40.

The gear 42 meshes with an intermediate gear 48 carried on the outer end of a slotted lever 49 adapted to be held in adjusted position by a clamping means 50. Gear 48 meshes with a rela-

tively small gear 51 on a shaft 52. Shaft 52 extends entirely across the winding mechanism through the frame pieces 41 and 31 and at the outer side of the latter mounts a relatively large gear 53 meshing with a smaller gear 54 fixed on the arbor carrying shaft 30. With the gear arrangement shown, it will be apparent that relatively slow motion of the crank 39 will result in a rapid rotation of the arbor 25. Pins 46 and 46a have their outer ends in the path of movement of crank 39. However, the crank is provided with a series of kerfs 55 whereby it may be flexed slightly in order to pass such stops.

Mounted on the shaft 40 are cams 56 and 57 of which the cam 56 (see Figs. 9 and 10) comprises a pair of similar cam-shaped plates 58 and 59 provided with raised bearing surfaces 60 and lower surfaces 61. Mounted between the plates 58 and 59 is a relatively thin plate 62 having an outer diameter or bearing surface 63 corresponding with the surface 60. All of these plates are clamped between a pair of nuts 64 and a collar 65 which latter may be fixed on the shaft as by means of a set screw 66.

On loosening of the nuts 64, the plate 62 may be adjusted about the shaft 40 so as to expose more or less of its surface 63 which in effect comprises a continuation of the surfaces 60 of the plates 58 and 59. The purpose of this will later be described but here attention is directed to the drop-off or shoulders 67 between the surfaces 60 and 61 of the plates 58 and 59.

Riding on the surface of cam 56 is a foot portion or shoe 68 of a lever 69 pivoted at one end as on a pin 70. At its inner end, lever 69 has the lower end of a push rod 71 passing therethrough and on such rod at opposite sides of the lever are nuts 72. It will be clear (see Fig. 5) that as the cam 56 turns in a clockwise direction the push rod 71 will be supported in an upper position while the foot portion 68 of lever 69 is riding on the high surface of cam 56 and that the push rod will be dropped down at the shoulder 67 of the cam and will remain down until the rise of the cam again enters under the said foot portion of the lever.

Bearing on the upper end of the rod 71 is a head or buttonlike portion 73 of a pin 74 fixed to the underside of a bar 75 connecting the forward ends of a pair of arms 76 pivoted at 77. Toward their forward ends, arms 76 carry a pivotally mounted roller 78 and on the upper side of the bar 75 is a plate 79. A bracket 80 fixed to the underside of the bar 75 includes a lip-like portion 81 inclined upwardly at the forward side of the bar.

Mounted at one end on a side of frame plate 32 and extending laterally from the latter over the plate 79 is a wedge-shaped dividing means or anvil 82. A roller 83 is mounted on a shaft 84 and is located at the upper side of the anvil 82 but slightly rearwardly thereof and an idler pin or roller 85 is disposed on the upper side of the anvil between the latter and the roller 83. Shaft 84 extends to the outer side of the machine frame where a crank 86, capable of flexing as will be set forth, is fixed to it.

A stop pin 87 is located in the path of turning movement of the crank 86 and is carried by an adjustable slotted arm 88 adapted to be clamped to a bracket 89 as by bolt and nut means 90. This bracket is supported on the frame plate 31 as best shown in Figs. 2 and 3. A second stop device for the crank 86 is provided and the same comprises a substantially L-shaped arm 91 fixed to the frame plate 31 by means of a screw 92 and having its free arm 93 disposed with its end in the path of movement of the crank 86. The cooperation between these stops and the crank will be fully set forth.

The present mechanism includes an automatic cut-off device and the same is here shown as a blade 94 fixed to the outer end of an arm 95 pivoted on a post 96. Pivoted at 97 to an intermediate part of the arm 95 is the upper end of an operating bar 98, the lower end of which rides on the cam 57. Such cam has a sharp shoulder or drop-off 99. A screw or other means 100 serves to attach the bar 98 to the forward end of a lever 101 pivoted intermediate its ends as at 102 to the frame member 12. Anchored to such frame member and to a pin 104 fixed to the rear end of the lever 101 is a coil spring 103.

This provides a load-and-fire mechanism for the operation of the blade 94. That is, while the lower end of bar 98 is riding on the higher portions of cam 57 the arm 95 is held in the upper position of Figs. 2, 3, 4 and 5 and the spring 103 is stretched or under tension. Then, when the arm 98 drops off the shoulder 99 of the cam 57, the spring 103 pulls upwardly on the inner end of lever 101 with the result that the bar 98 is snapped downwardly and rocks the arm 95 about its pivotal connection with the post 96 giving the blade 94 a cutting movement.

In the use of the machine the laminated structures 26 and 27 are fed to the arbor 25 by passing of the elements of the structure 26 under a guide or idler means 105 and over the pivoting means 77 under the rollers 83 and 85 and over the anvil 82. The elements of the structure 27 pass over the roller 78 and at the under side of the anvil 82 and beyond the anvil both structures go directly to the arbor 25.

Following the completion of a condenser the forward ends of structures 26 and 27 are positioned as shown in Fig. 8 where the blade 94 has just been given a cutting stroke. This leaves a partially formed condenser 106 on the arbor and with the cut end portion of the structure 26 of said condenser extending beyond the cut end portion of the structure 27 of said condenser. As the arbor is further turned each cut end will flop over against a label guide 107 fixed below the arbor. At this point the upper end portion of the chute is against the partially formed condenser so that the latter is prevented from opening up or partially uncoiling on the arbor.

Now a label is wetted or made adhesive and is disposed against the inner faces of the cut ends while the arbor is stationary. When the label has been positioned, turning of the arbor is resumed and the label being longer than the cut ends of the condenser is wrapped about the outer side of the latter. The upper end portion of chute 107 yields slightly to permit of the winding up of the end portion of the condenser and the label. Now through use of the knob 38 the arbor portion 33 is moved longitudinally from overlapping relation with the arbor portion 28.

Then a stripper device is manually operated to eject the completed condenser from the arbor portion 28. Such stripper device comprises a plate 108 mounted at its upper end on a bar or rod 109 and kerfed or grooved at its lower end to straddle the arbor, as best shown in Fig. 6. The bar or rod 109 is slidably mounted in a guide 110 and is normally kept in retracted position by coil spring 111. Clearly, when the arbor portion 33 is drawn from overlapping relation with the arbor

portion 28, shifting of rod 109 toward the right will cause the plate 108 to strip the completed condenser from the arbor portion 28.

Now to proceed with the formation of the next condenser, the operator flexes the crank arm 86 outwardly to free it from the edge of the stop arm 93 and moves the crank in a counter-clockwise direction until it engages the stop pin 87. This results in a turning of the roller 83. Such roller has the laminated structures 26 and 27 clamped against its under side by the roller 78 and thus turning of roller 83 results in a feeding of the laminated structures toward the arbor.

The amount of this feed is controlled by the location of stop pin 87, which location is readily variable within the limits of adjustment provided for by the slot in the arm 88. At this time, the parts of the arbor are separated and the leading ends of the laminated structures 26 and 27 are simply fed over the arbor part 28. When the preliminary feed has been made, as shown in Fig. 6, a folding device 112 is swung up as to the position of said Fig. 6. This device is of sheet metal and is pivotally mounted as at 113 and includes a lip or presser portion 114, a handle 115 and a flat finger-like holder portion 118.

When the device 112 is positioned as in Fig. 6, it is holding the leading end portions of laminated structures 27 and 26 together and against the anvil 82 so that the leading end of structure 26 is drawn rearwardly of the leading end of structure 27. Additionally, the holder portion 118 is drawing both the laminated structures 26 and 27 closely over the arbor portion 28. While the device 112 is held in this upper position the operator presses the knob 38 to move the arbor portion 33 back into overlapping relation with the arbor portion 28. Portion 118 of device 112, during this operation helps to keep the laminated structures together so that the return movement of the arbor portion 33 is such as to dispose the latter over both laminated structures. During all of the time the rollers 78 and 83 occupy the relative positions in which they are shown in Fig. 6.

Now the crank 39 is positioned against the stop 46*a* as in Fig. 1. The operator releases the folding device 112 and grips the handle of the crank flexing the latter to pass the end of stop pin 46*a* and move the crank about until it engages stop pin 46. As the crank is so moved it turns the gear 42 and shaft 40 and through the previously described intermediate gearing drives the arbor whereby the elements of the laminated structures are drawn from their respective reels and the laminated structures wound onto the arbor one within the other.

The amount of material wound onto the arbor is determined by the relative positions of the stops 44 and 44*a* on the plate 43. Obviously, when stop 44 is adjusted from the position of Fig. 1 in a counterclockwise direction along the edge of the plate 43 the movement of the crank 39 between the stop pins 46*a* and 46 will be substantially lessened. When the stop 44 is adjusted the plate 62 of the cam 56 is adjusted accordingly so that the high surface of said cam will correspond with the distance from stop pin 46*a* to stop pin 46.

At the beginning of the described movement of the crank, turning of the shaft 40 in a clockwise direction results in a corresponding movement of the cam 56 with the shaft 40 and at such time the shoe 68 of arm 69 while on the high surface of the cam is closely adjacent the shoulder thereof, thus as the operator moves the crank the initial movement carries the cam 56 from under the foot 68 permitting the lever 69 to rock down to the position of Fig. 5. This results in a dropping of the push rod 71 and a swinging movement of the arms 76 and parts carried thereby to a lower position as in Figs. 5 and 7. From these figures it will be apparent that at this time the rollers 78 and 83 are no longer clamping the strips of paper and foil so that there is no excessive drag as the latter are wound about the arbor.

At this same time the rod 98 is on a higher portion of the cam 57 so that the blade 94 is in elevated position. As the crank 39 approaches the stop pin 46 the high portion of cam 56 enters under the foot 68 shifting the push rod 71 upwardly and rocking the arms 76 on pivot 77 to carry the roller 78 into a position to clamp the various strips of the two laminated structures against the roller 83. As this is accomplished the high portion of cam 57 moves from under rod 98 and the spring 103 having been tensioned acts through the lever 101 to draw said rod downwardly and cause the blade 94 to cut the strips.

This cutting of the respective laminated structures 26 and 27 takes place at the upper and lower forward corners 116 and 117 respectively of the anvil 82. Due to the presence of this anvil the respectively laminated structures are separated and caused to travel paths of different lengths. Thus at the time of cutting operation the corner 116 of the anvil is a greater distance from the arbor 25 than is the corner portion 117. Therefore, when the cut is made the cut end of laminated structure 26 extends beyond the cut end of laminated structure 27 as in Fig. 8 and when such ends are wound into the condenser proper there is no danger of a short between the foil of laminated structure 26 and that of laminated structure 27.

At the time of the cut, roller 78 is clamping the various strips against the roller 83 so that there is no danger of the strips falling out from between the various guides when the pull through the arbor is released. Now the operator springs the crank arm 39 to pass the stop pin 46 and moves the crank arm over until it again engages the stop pin 46*a*. This movement results in the wrapping of the label into and about the condenser so that the latter is completed and further results in a shifting of the cam 57 for such a distance as to raise the blade or knife 94 to an elevated and inoperative position.

Since the laminated structures were cut at different points in their length, it will be apparent that as they are again fed forward by operation of the crank 86 their lead ends also will be disposed one beyond the other. Thus the lead end of the laminated structure 27 will extend beyond the lead end of the laminated structure 26 so that there is no danger of a short circuit between the foils of these structures at their leading ends. Thus it will be seen that with the present machine the cutting of the laminated structures at different distances from the arbor results in the lead end of the laminated structure 27 being ahead of the lead end of the laminated structure 26 of each condenser and the tail end of the laminated structure 26 of each condenser extending beyond the tail end of the laminated structure 27.

Depending on which structure travels the longer path and as to where the cut is made, either structure may have its cut end extending beyond the cut end of the other. The present mechanism so

functions that it is not necessary for the operator to open a laminated structure at each end of the condenser and tear off a portion of the foil. Thus the machine provides for the rapid production of condensers and also for condensers of uniform capacity since in each condenser produced with the present machine the full predetermined amount of foil is present.

The crank arm **86** is easily sprung by the stop pin **87** and in fact the operation of the machine is such that when the crank **39** is in use, as in moving between the stop pin **46***a* and the stop pin **46**, the crank **86** simply drops off or is moved from the stop pin **87** to a position against the stop arm **93**. Thus the initial feeding of the laminated structure to the arbor by operation of the crank **86** is limited to a set amount and the feeding of the structure thereafter by operation of the crank **39** is for a fixed amount. For these reasons condensers made on the machine of the invention are of uniform capacity.

Since the machine of the invention cuts the laminated structures so that at each of its ends the end portion of one extends beyond the end portion of the other, the previous method of opening the laminations and tearing out a portion of foil is unnecessary. Accordingly with the present machine foil and paper are not wasted as in the tear-out method previously practised and increased production speed is attained. Further, condensers made on the present machine are produced free from finger moisture as the operations are entirely mechanical.

It is also noted that relative adjustments of the stops **44** and **44***a* will serve either to lengthen or shorten the winding movement of the crank and the amount of material wound onto the arbor. Thus it will be seen simply by adjusting the stops different capacities of condensers are readily wound.

Having thus set forth the nature of our invention, what we claim is:

1. In a condenser winding machine, an arbor, an anvil providing paths of unequal lengths for the movement of laminated structures to said arbor, means to turn said arbor to wind said structures thereon one within the other, and means for cutting said structures at spaced edges of said anvil whereby the cut end of one structure extends beyond the cut end of the other structure.

2. In a condenser winding machine, an arbor, an anvil having a pair of surfaces of which one is closer to the center of said arbor than is the other, means for feeding a pair of laminated strips to said arbor one at each surface of said anvil, means for turning said arbor to wind said strips thereon one within the other, and means for cutting said strips at the respective surfaces of said anvil whereby the cut end of one strip extends beyond the cut end of the other.

3. In a condenser winding machine, a pair of rollers of which one is movable to and from clamping relation with the other, means for supplying a pair of laminated strips between said rollers, an arbor forwardly of said rollers, means for rotating one of said rollers while they are in clamping relation to feed said strips to said arbor, means for rotating the arbor to wind said strips thereon one within the other, means whereby the movable roller is moved out of clamping relation with the other roller as said arbor is turned, means to move said movable roller back into clamping relation with the other roller on predetermined rotation of the arbor, and means then automatically operable to cut said strips at a point between said rollers and said arbor.

4. In a condenser winding machine, a horizontally disposed arbor, means for supplying a pair of laminated strips to said arbor, means for turning said arbor to wind said strips thereon one within the other, an anvil over and under which said strips may be fed, means for cutting said strips at the respective upper and lower forward corners of said anvil, and said anvil disposed with one of said corners at a greater distance than the other from said arbor whereby the cut end of one strip will extend beyond the cut end of the other strip.

5. In a condenser winding machine, an arbor, a pair of clamping and feeding rolls rearwardly of said arbor, means mounting one of said rolls for movement toward and from clamping and feeding relation with the other thereof, means for turning one of said rolls for feeding material toward said arbor while said rolls are clamping such material between them, means for turning said arbor to wind such material thereon, means for moving said one of said rollers out of clamping relation with the other thereof while said arbor is being turned and to move it back into clamping relation on predetermined turning of said arbor, and means then operable to cut said material at a point between said rolls and said arbor.

6. In a condenser winding machine, an arbor, a pair of clamping and feeding rolls rearwardly of said arbor, means mounting one of said rolls for movement to and from clamping and feeding relation with the other thereof, means for turning one of said rolls to feed a pair of strips toward said arbor while said rolls are clamping said strips between them, means intermediate said arbor and said rolls and separating said strips, means for turning said arbor to wind said strips thereon one within the other, means for moving said one of said rollers out of clamping relation with the other thereof while said arbor is being turned and to move it back into clamping relation on predetermined turning of said arbor, means then operable to cut the strips at the place of separation intermediate the rolls and arbor, and said means effective to cut said strips so that the cut end of one strip extends beyond the cut end of the other strip.

7. In a condenser winding machine, an arbor adapted to be turned to wind laminated strips thereon one within the other, means for turning said arbor including a crank and intermediate gearing, a pair of stops of which at least one is adjustable relative to the other, a cutter having a normal retracted position and adapted for cutting the strips, means whereby as said crank is moved from the first of said stops material from said strips is wound onto said arbor and as said crank approaches the second stop said cutter is actuated to cut said strips, and means whereby as said crank is thereafter moved forwardly from the second stop toward the first stop the cut ends of said strips are wound onto said arbor and said cutter is moved back to normal position.

8. The combination as in claim 6 including an adjustable stop mounted on said machine in the path of movement of said means for turning one of said rollers for determining the amount of turning of said one of said rolls and thereby the amount of feed of said strips by said rolls.

9. In a condenser winding machine, a longitudinally divided two part arbor, means at the

inner end of one of said arbor parts and mounting the same for rotation, means to rotate said means and arbor part, means mounting the other of said arbor parts for longitudinal movement to and from overlapping relation with the first mentioned part and for rotation therewith when in overlapping relation therewith, an ejector including a plate extending radially from and straddling the first mentioned arbor part adjacent the inner end thereof, a rod connected with said plate and arranged parallel with the arbor, means extending radially of said arbor and mounting said rod for longitudinal movement to permit the plate to be moved along said arbor part toward and from the outer end thereof, and spring means for actuating said rod in one direction.

10. The machine as in claim 1 wherein said cutting means comprises a blade and a load-and-fire mechanism for imparting cutting movement to the blade.

11. The machine as in claim 5 wherein the means for turning the arbor includes a shaft, a cam on said shaft, and means riding on said cam and controlling the position of the movable roller relative to the other roller.

12. The machine as in claim 6 wherein the means for turning the arbor includes a shaft, a cam on said shaft, and means riding on said cam and controlling the position of the movable roller relative to the other roller.

13. In a condenser winding machine, an arbor adapted to be turned to wind laminated strips thereon one within the other, a pair of clamping rolls rearwardly of said arbor, means mounting one of said rolls for movement to and from clamping and feeding relation with the other thereof, means for turning one of said rolls to feed a pair of laminated strips toward said arbor while said rolls are clamping said strips between them, means for turning said arbor including a crank, shafts and gearing, a pair of stops of which at least one is adjustable relative to the other, a cutter having a normal retracted position and adapted for cutting said strips at a place between the rolls and the arbor, means whereby as said crank is moved from the first of said stops said movable roll moves from clamping relation with the other roll and said arbor is turned to wind said strips thereon and as the crank approaches the second of said stops said roll is moved back to clamping relation and said cutter is actuated to cut said strips, and means whereby as said crank is thereafter moved forwardly from the second stop toward the first stop the cut ends of said strips are wound onto said arbor and the cutter is moved back to normal position.

14. The machine as in claim 13 including a cam on a shaft of the means for turning the arbor, means riding on said cam and controlling the position of said movable roller, and said cam including a part adjustable in accordance with the position of said adjustable stop.

15. In a condenser winding machine, an arbor, means for supplying a pair of laminated strips to said arbor, said arbor comprising a pair of elongated parts, means mounting one of said parts for longitudinal movement from overlapping relation with the other part to permit said laminated strips to be carried over said other part, means to then fold said strips to draw the leading end of one rearwardly with respect to the other and to also press said strips toward said other arbor part, said one arbor part then movable back into overlapping relation with the other arbor part and over said strips, means to drive said other arbor part and thus the entire arbor when its parts are in overlapping relation to wind said strips thereon, and means automatically operable on predetermined turning of said arbor to cut said strips at different points in their lengths whereby the end of one strip extends beyond the end of the other.

THOMAS T. LOGIE.
JOSEPH J. GALLA.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,850,102	Grout	Mar. 22, 1932
1,952,606	Purdy	Mar. 27, 1934
2,040,323	McCain	May 12, 1936
2,119,445	Scott	May 31, 1938
2,205,171	Kile et al.	June 18, 1940
2,255,498	Babillis	Sept. 9, 1941
2,358,654	Nordberg	Sept. 19, 1944
2,416,540	Nordberg	Feb. 25, 1947