March 15, 1927. 1,620,879

A. J. FATHAUER

COIL WINDER

Filed Feb. 28, 1925 2 Sheets-Sheet 1

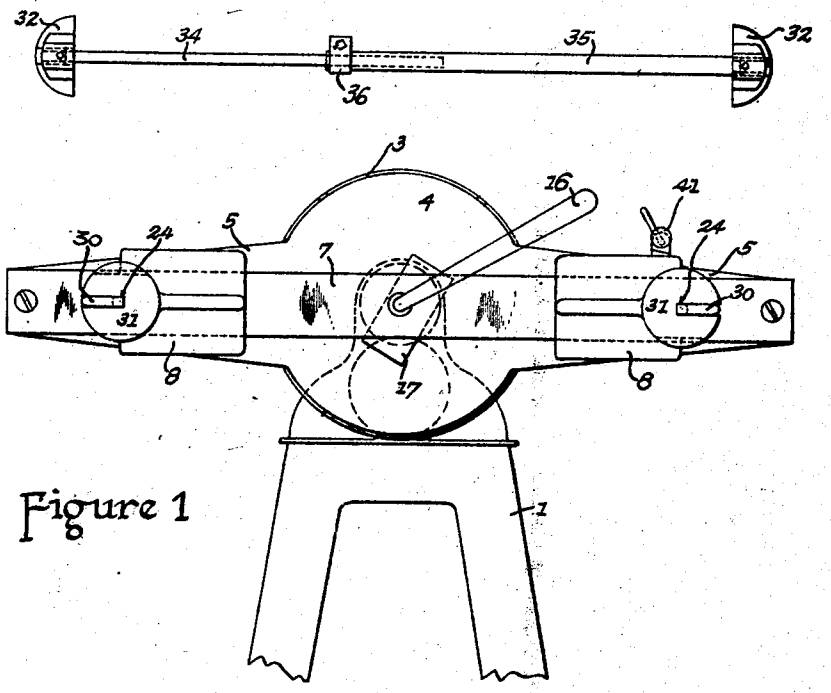


Figure 1

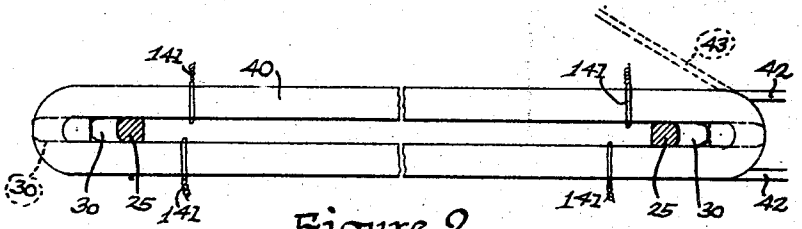


Figure 2

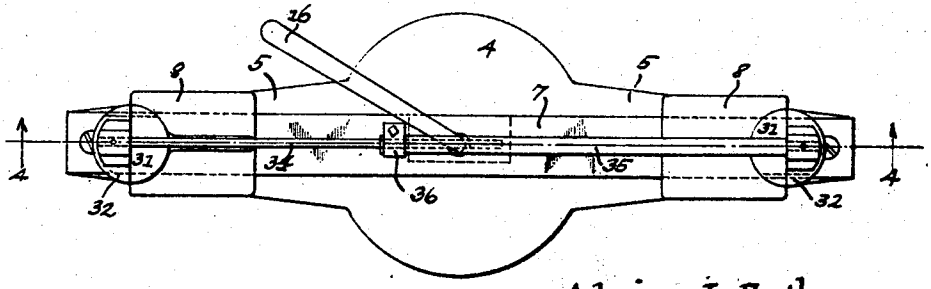


Figure 3

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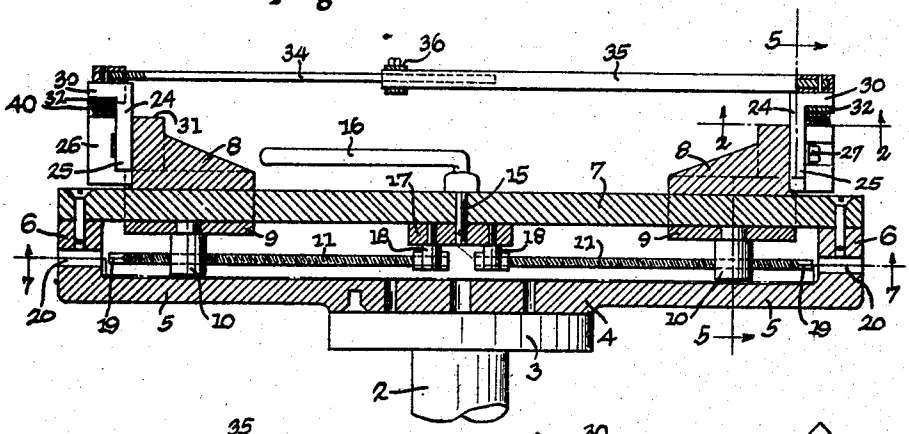
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A. J. FATHAUER

COIL WINDER

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Figure 4



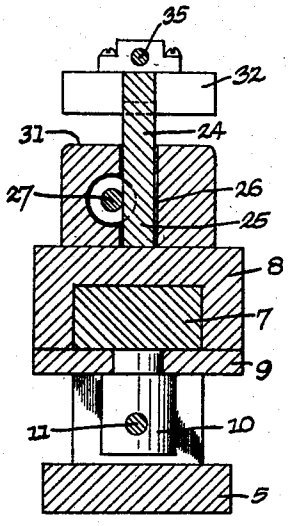


Figure 5

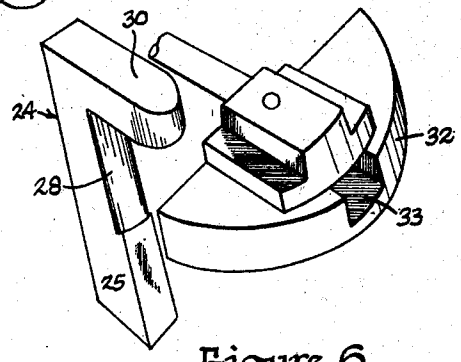


Figure 6

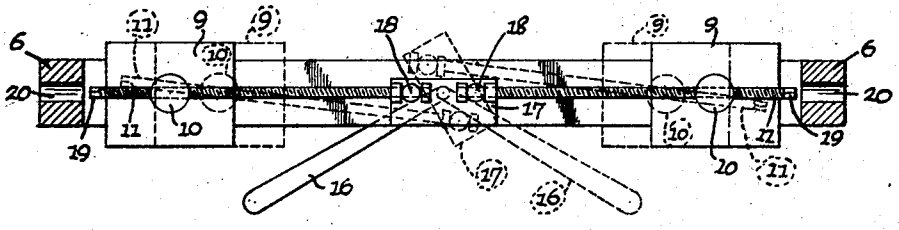


Figure 7

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Patented Mar. 15, 1927. 1,620,879

UNITED STATES PATENT OFFICE.

ALVIN J. FATHAUER, OF CLEVELAND, OHIO.

COIL WINDER.

Application filed February 28, 1925. Serial No. 12,202.

This invention relates to coil-winding apparatus such as is used in the manufacture and repair of electric motors and generators and has for its object the provision of a new and improved device for holding the coil during the winding and releasing the coil when completed. In the manufacture of such machinery it is customary to wind the insulated wire first in the form of an elongated narrow coil, and afterwards shape that coil to the desired form by pulling it apart and bending its different portions according to the particular pattern of the rotor, stator, or other part to which the coil is to be applied. Excepting in the very smallest of machines the wire used in these coils is generally of considerable size and stiffness and is wound under very considerable tension so that difficulty has heretofore been experienced in removing the coil from the winding form without disarrangement of its parts, injury to the insulation, or undue delay in the manipulation.

The objects of the present invention are the provision of a winding form having new and improved arrangements for holding the coil during the winding and releasing the same when wound; the provision of a device of this nature wherein the abutments upon which the coil is wound can be quickly and conveniently retracted so as to free the coil and afterwards restored into extended position for the reception of a succeeding coil; the provision of new and improved expedients for fastening and releasing the removable part which shapes the outer face of the coil; while further objects and advantages of the invention will become apparent as the description proceeds.

In the drawings accompanying and forming a part of this application I have shown one physical embodiment of my inventive idea although it will be understood that these drawings are intended to be merely illustrative of the general principles of my invention and not exhaustive as to detailed constructions.

Fig. 1 is a front elevation of my improved coil winder showing the abutments retracted and the removable part of the winding form displaced; Fig. 2 is a sectional view corresponding substantially to the line 2—2 of Fig. 4 showing a completed coil just prior to removal from the winder; Fig. 3 is a front elevation similar to Fig. 1 showing the position of the parts with the abutments so expanded and the removable cheeks in place; Fig. 4 is a sectional view corresponding to the line 4—4 of Fig. 3 looking upwardly; Fig. 5 is a sectional view corresponding to the broken line 5—5 in Fig. 4; Fig. 6 is a separated perspective view of one of the abutments and cheek pieces and Fig. 7 is a sectional view corresponding to the line 7—7 of Fig. 4.

For purposes of illustration I have shown a mechanically operated winder comprising a stand or support 1 having journaled therein a horizontal shaft 2 provided with a face plate 3 to which is tightly secured the base member 4 of my improved winder. This member is formed at opposite sides with radial arms 5—5 having outwardly extending spacing projections 6—6 at their ends. Tightly secured to these projections is a rectangular bar 7 extending diametrically past the end of the shaft and having slidably mounted thereon a pair of hollow blocks or carriers 8—8. These carriers are mounted and secured in place in any suitable manner, in the present instance by embracing the bar 7 and being provided at their bottoms with removable plates 9 in each of which is mounted a pivoted turret 10 traversed by a long threaded rod 11.

At the middle of the bar 7 I mount a rock shaft 15 having at one end the handle 16 and at the other end the block 17. Pivoted to this block upon opposite sides of the rock shaft are eye-bolts 18—18 in which are swiveled the inner ends of the rods 11—11. When the block 17 is turned to a position parallel with the bar 7 the carriers 8—8 occupy their positions of greatest separation but by rotating the rock shaft 15 as shown by the dotted lines in Fig. 7, the rods 11 are caused to retract said carriers by equal amounts. The outer ends of the rods 11 are formed with prismatic portions 19—19 for the reception of a socket wrench which can be inserted through holes 20—20 in the projections 6—6 thus enabling an adjustment of the distance between the carriers and hence the length of the coil.

Projecting outwardly from the outer faces of the carriers 8—8 are the abutment members 24—24 on which the coil is wound. In their preferred form these abutment members consist of elongated shanks 25 adjustably secured in slots 26 and secured by clamping bolts 27. The edges of these shanks are rounded as at 28 for the recep-

tion of the wire and their outer ends are formed with suitable heads for the reception of the removable cheek pieces. In the form herein shown these heads consist of square-sided portions 30—30 projecting away from the center of the bar.

The outer face of each carrier 8 is formed adjacent to this abutment with a flat cheek 31 against which the coil is wound. A companion cheek-piece 32 is detachably secured to each of the abutments 30, in the present instance by being formed with a recess 33 snugly receiving the head 30. These removable cheek pieces are connected together in some suitable manner as, in the present instance, by a telescoping connection comprising a rod 34 secured to one member and a tube 35 connected to the other member, a suitable clamping device 36 being provided whereby the parts can be secured together. In the present embodiment I have shown the cheek pieces 32 as semi-circular, subtending only the outer portion of the turn of the coil, while the cheeks 31 are completely circular, being intersected only by the slots 26. These are minor details and are mentioned only to facilitate an understanding of the embodiment shown in the present drawing.

In use the cheek-pieces 32 are applied to the heads as illustrated in Fig. 4, the abutments being so adjusted in their slots as to space the same from the cheeks 31 a sufficient distance to accommodate the coil 40, the clamp 36 being tightened at such a point as shall hold the members tightly when the abutments are expanded. One end of the wire is secured to a suitable clamp 41 carried on a suitable point on the rotating arm and the head slowly revolved, the wire being guided into the slots under substantial tension thereby forming a long narrow coil 40 as shown in Figs. 2 and 4. When the winding is complete and before the coil is removed it may be tied together by suitable wires 141 so as to hold the turns in position. The terminals 42 of the wire are also generally brought out parallel to each other as shown in Fig. 2, one of the same often being bent at this time from some other position such as that shown in dotted lines at 43. The handle 16 is then rocked as heretofore described so as to retract the abutments as shown in Figs. 1 and 2 whereupon the removable cheek pieces are instantly released and all tension removed from the coil so that the same can be readily removed and laid to one side after which the removable cheek pieces are replaced, the handle restored to its former position, and the operation repeated.

It will be understood that I do not limit myself to the particular form of slide bar 7 herein shown or to the particular mode of expanding and retracting the abutments, nor to the detailed shape of the cheek-pieces, nor to the exact mode of connecting said cheek-pieces together or to the abutments, nor to any other details except as specifically recited in my several claims.

Having thus described my invention what I claim is:

1. A coil-winder comprising a rotating member, a pair of carriers mounted thereon and movable radially toward and away from the axis of rotation, rigid abutments located on said carriers and adapted to receive a coil of wire, screw-threaded means for moving said carriers toward and from each other, and means additional to said screw-threaded means for displacing said carriers toward and from each other to release the coil therefrom, without losing the screw-threaded adjustment.

2. A coil winder comprising a bar, means supporting said bar for rotation about an axis transverse of its length, a pair of carriers slidable along said bar, abutment members projecting from said carriers and adapted to have a coil wound thereon, screw-threaded means for sliding said carriers along said bar towards and away from each other and for holding said carriers in separated position during the winding of the coil thereon, and additional means for moving said carriers and threaded means bodily to free said abutments from a coil thereon.

3. A coil winder comprising a bar, means supporting said bar for rotation about an axis transverse of its length, a pair of carriers slidable along said bar, abutment members projecting from said carriers and adapted to have a coil wound thereon, said abutment members having heads, a pair of cheek members slidably engaging said heads, screw-threaded means for sliding said carriers along said bar towards and away from each other and for holding said carriers in separated position during the winding of the coil thereon, and means additional to said screw-threaded means for retracting said carriers relative to each other to free a coil from said abutment members.

4. A coil winder comprising a bar, means supporting said bar for rotation about an axis transverse of its length, a pair of carriers slidable along said bar, abutment members projecting from said carriers and adapted to have a coil wound thereon, said abutment members having heads, a pair of connected cheek-members slidably engaging said heads, and means for sliding said carriers along said bar whereby said cheek-members are secured and a coil supported when said carriers are expanded, and whereby said cheeks and coil are released when the carriers are retracted.

5. A coil winder comprising a rotatable member, a pair of abutments mounted on said member and movable toward and away from each other along a straight line which

is normal to the axis of rotation, said abutments having portions adapted for the reception of a wire coil and other portions adapted for the reception of removable cheek pieces, lever-operated means for moving said abutments, one toward and way from the other and for holding said abutments rigidly in their position of maximum separation, and means additional to said lever operated means for adjusting the distance between said abutments.

6. A coil winder comprising a rotatable member, a pair of carriers slidably mounted on said member and movable radially of the axis of rotation, abutment members secured to said carriers and adapted to have a coil wound thereon, said abutments having heads, screw-threaded means for moving said carriers toward and from each other to fix the size of a coil, and additional means operable without rotation of said screw-threaded means for holding said carriers in separated position while a coil is being wound thereon and for retracting them when said coil has been finished, thereby releasing the tension on said coil and enabling it to be freely removed without changing the adjustment of screw-threaded means.

7. A coil winder comprising a rotatable member, a pair of abutments mounted on said member and movable toward and away from each other along a straight line which is normal to the axis of rotation, said abutments having portions adapted for the reception of a wire coil and other portions adapted for the reception of removable cheek-pieces, a pair of cheek-pieces adapted to fit said last portions, means securing said cheek pieces rigidly together, and means for moving said abutments one toward and away from the other, whereby said coil and cheek-pieces are simultaneously released.

8. A coil winder comprising a rotatable member, a pair of carriers mounted thereon and movable one toward and away from the other along a line which is normal to the axis of rotation, means including toggle joints for moving said carriers toward and from each other, the arms of said toggles being of adjustable length whereby the length of the coil may be varied, and an abutment on each carrier adapted to receive the wire.

In testimony whereof, I hereunto affix my signature.

ALVIN J. FATHAUER.