Feb. 1, 1949. M. B. GROUT 2,460,639

MEANS FOR BINDING MAGNETIC CORE STRUCTURES

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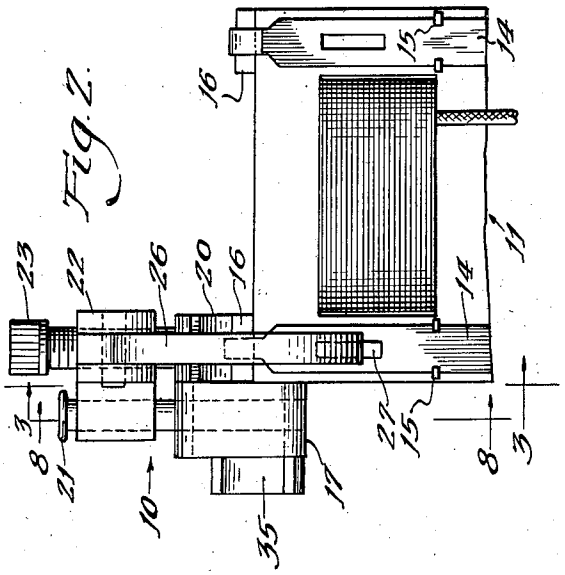


Fig. 2.

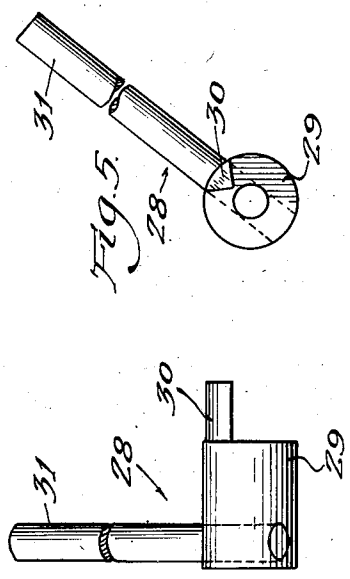


Fig. 5.

Fig. 4.

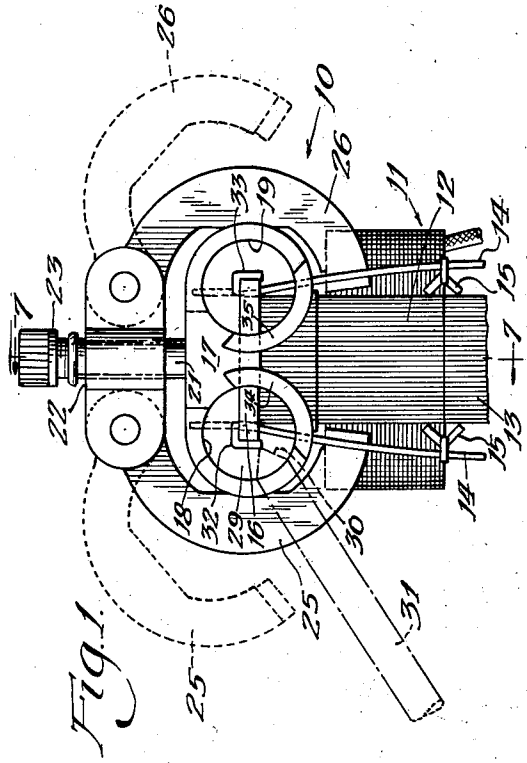


Fig. 1.

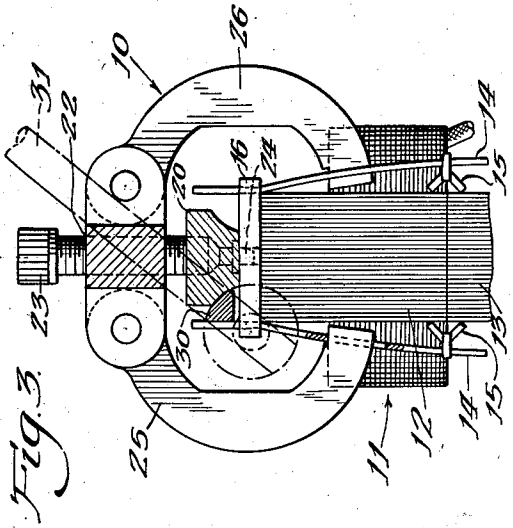


Fig. 3.

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Fig. 6.

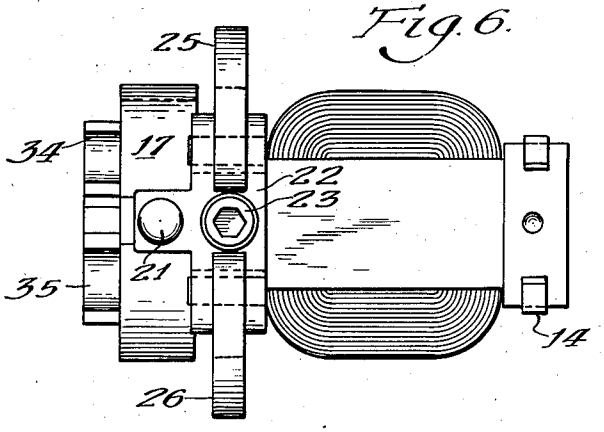


Fig. 7.

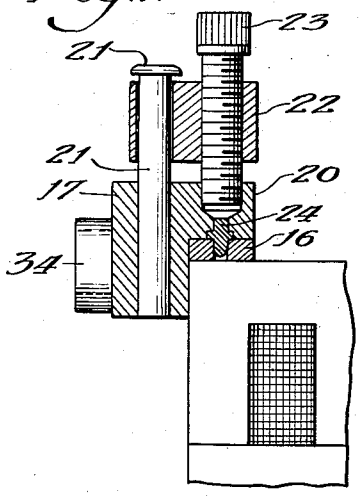
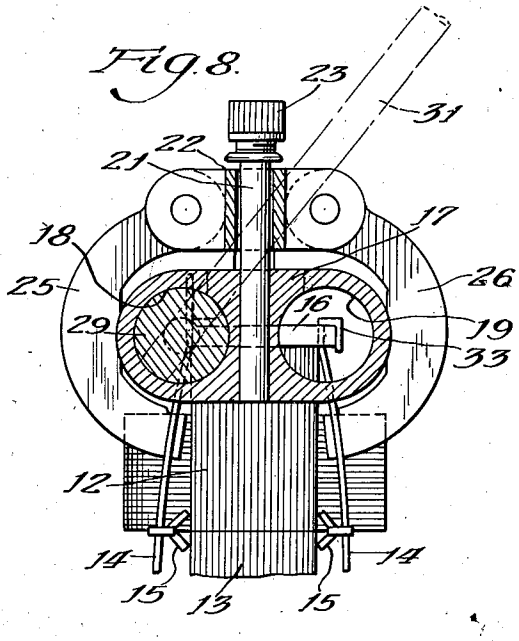


Fig. 8.



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Patented Feb. 1, 1949 2,460,639

UNITED STATES PATENT OFFICE

2,460,639

MEANS FOR BINDING MAGNETIC CORE STRUCTURES

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Application September 11, 1944, Serial No. 553,616

5 Claims. (Cl. 153—1)

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This invention relates to a fixture for tightening and securing a strap around a magnetic core structure.

Reference is made to copending application of Leopold Mauerer, Serial No. 519,732, filed January 26, 1944, (Patent No. 2,431,950 granted Dec. 2, 1947), for a disclosure of the particular type of core structure in which a strap may be advantageously used to clamp the various sections of the core structure together. In that application a U-shaped clamping strap is used which cooperates at one end of the core structure with a cross bar or other like element in such a manner that the strap may be tensioned to hold the abutting sections of the core in operative relationship.

In the present invention it is contemplated that the ends of the U-shaped strap be threaded through a cross bar, then that the strap be tensioned, and then that the ends which project through the cross bar be bent over or crimped so that the structure as a whole may be maintained in tensioned relationship.

The preferred embodiment of the invention herein shown and described constitutes a fixture or jig which may be applied to the core structure so that the steps above enumerated can be easily and quickly performed.

The principal object of this invention is to provide means for drawing up or tensioning such a strap, and for deforming it while the strap is maintained under tension, the deformation being of such character that the strap will interlock with a cooperating member so that the strap will be maintained under tension even after the fixture is removed.

Other objects are to provide a fixture of this general type which is of comparatively simple construction and operation.

Various other objects, features and advantages will appear as the description proceeds.

With reference now to the drawing in which like numerals designate like parts;

Fig. 1 is an elevation of a preferred embodiment of this invention as it is applied to a magnetic core structure, a changed position of the parts being shown in broken lines;

Fig. 2 is an end view of Fig. 1;

Fig. 3 is a section taken along line 3—3 of Fig. 2;

Fig. 4 is a view of the bending tool;

Fig. 5 is an end view of Fig. 4;

Fig. 6 is a top view of Figs. 1 and 2;

Fig. 7 is a section taken along line 7—7 of Fig. 1; and

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Fig. 8 is a section taken along line 8—8 of Fig. 2.

The reference numeral 10 designates generally the jig or fixture. As shown in the figures, it is designed to cooperate with an electromagnetic core structure, which here is shown as being made in a plurality of sections, section 12 being a reactance core and section 13 being a transformer core. These two sections are held in closely abutting relationship by means of a U-shaped strap 14 which is provided with rockers 15 which bridge the joint between the two sections, and serve to apply lateral pressure to the laminations of each section to prevent spreading. This construction, and the advantages thereof are pointed out in greater detail in the copending application above referred to.

As a means of securing the strap in position, and for maintaining it under the proper tension, an end bar 16 is provided which overlies the edges of the laminations of the core section 12. This end bar 16 is apertured so that the ends of the strap 14 may be threaded through the same.

The fixture 10 serves to draw up the strap and to bend over the ends thereof so that the strap will be maintained under tension, the bent over ends being designated in Fig. 1 by the reference numerals 32 and 33.

The fixture comprises a body member 17 which is provided with cylindrical bores 18 and 19, these bores being substantially aligned with the ends 32 and 33. The body member is also provided with a rearwardly projecting portion 20, which is best shown in Figs. 2, 3 and 7. This projection is adapted to rest on the end bar 16, as shown in Fig. 2.

The body 17 carries a pin 21 on which a block 22 is slidably mounted. The block carries a screw 23 which is in screw threaded engagement with the block, the end of the screw 23 being received in the central projecting member 20 so that the body member 17 may be forced downwardly with respect to block 22 as the screw is tightened. The central projecting member 20 may also be provided with a pin 24 which is adapted to fit into the aperture in the end bar 16. Thus the fixture 10 may be properly centered with respect to the core structure 11. As herein shown, the pin 24 is co-axial with the bore in which the screw 23 is received, although of course the pin may occupy any suitable position in the projecting member 20, or a plurality of pins may be used if desired.

The block 22 carries clamping arms 25 and 26, which are pivotally mounted on block 22 so that

they may be brought down from the dotted line position shown in Fig. 1, into the solid line position, in which they engage the strap 14. The strap is provided with apertures 27 in which the ends of the clamping arms 25 and 26 are received.

It will be seen that after the fixture 10 is centered with respect to the core structure 11, the clamping arms 25 and 26 may be brought into engagement with the strap 14. Then as the screw 23 is tightened, the end bar 16 will be forced downwardly with respect to the strap, or the strap will be drawn upwardly with respect to the end bar. This relative movement of the parts causes the core sections 12 and 13 to be pressed into that tightly abutting relationship which is desirable for proper operation of the electromagnet device, and which also results in the ends of the strap being projected through the end bar 16 by an increment which corresponds to the extent of the tensioning action.

After the strap 14 has been tensioned to the proper degree, the ends of the strap are bent over into the positions designated by the reference numerals 32 and 33 so that this tension may be maintained after the fixture 10 is removed. This is accomplished by a tool 28 shown in Figs. 4 and 5, the tool comprising a plug 29 having a rearwardly projecting edge 30 which is adapted to engage the ends of the strap. The tool is also provided with a handle 31.

In operation the plug 29 is fitted into the bore 18 so that the edge 30 engages the right side of the end of the strap, as the parts are viewed in Fig. 1. Rotation of the tool in a counterclockwise direction will result in the bending over of the strap into the position designated by the reference numeral 32.

It will be observed that the body member 17 is provided with partial sleeves 34 and 35 which project from the front surface thereof, and are concentric with the bores 18 and 19. These sleeves extend through only a portion of the full 360°, and they serve as stops to limit the motion of the handle 31 of the tool. More specifically, they prevent inadvertent rotation of the tool downwardly against the central portion of the end bar 16 at the inception of the bending operation, and at the conclusion they prevent the rotation of the tool into engagement with the strap 14.

The operation of the device as a whole has been pointed out above in detail in connection with the description of parts. It is sufficient to point out that after the fixture 10 is applied to the core structure 11, and after the strap 14 has been tensioned by tightening the screw 23, the tool 28 may be inserted first in bore 18 to bend over end 32, and then into bore 19 to bend over end 33. After this is done, the screw 23 may be loosened a bit so that the clamping arms 25 and 26 can be disengaged from the strap 14, thereby permitting removal of the fixture 10.

It is contemplated that in mass production of electromagnet units embodying this strap construction, the screw 23 may be engaged and tightened by a motor driven chuck, embodying an adjustable slip clutch by means of which the tension from the strap 14 may be automatically regulated. However, it will be obvious that such motor driven means may be physically incorporated with the fixture 10, if so desired.

Although only a preferred embodiment of this invention has been shown and described herein,

it will be obvious that various modifications and changes may be made therein without departing from the spirit of this invention. The foregoing description and the drawings are deemed to be illustrative only, and the invention is limited only by the appended claims.

I claim:

1. Apparatus for use in binding a sectional magnetic core structure which includes a U-shaped strap and a cooperating end bar, said apparatus comprising a body member having a surface adapted to rest on said core structure, a block slidably associated with said body member, strap interlocking means carried by said block, means for forcing said block away from said body member to tension said strap, and means cooperating with said body member for deforming the ends of said strap while it is maintained under tension by said interlocking means so that said deformed ends will cooperate with said end bar to maintain the parts in tensioned relationship after said apparatus is removed.

2. Apparatus for use in binding electromagnet core structures which are provided with a U-shaped strap, and with an end bar through which the strap extends, said apparatus comprising means to interlock with the strap, means to draw up on said strap interlocking means with respect to the end bar so that the ends of said strap will be projected through said end bar, means providing a pair of spaced apart bearings and adapted to be removably secured to said end bar so that said bearings are substantially aligned with the projecting ends of the strap, and means rotating in one of said bearings for engaging one end of said strap and for bending it over while said strap is maintained under tension by said interlocking means.

3. Apparatus for use in binding a sectional magnetic core structure which includes a U-shaped strap and a cooperating end bar, said means comprising a body member adapted to be mounted on said end bar, a second member slidably associated with said body member, strap engaging means mounted on said second member for movement into and out of engaging relationship with said strap, means for shifting the spacial relationship between said second member and said body member against the tension of the strap, one of said members being provided with a bore, a rotatable element journaled in said bore, and a strap bending member projecting eccentrically from said rotatable element and adapted to engage said strap at a point between an end thereof and said end bar, whereby rotation of said rotatable element will cause an end of said strap to be bent over against said bar.

4. Apparatus for use in binding a sectional magnetic core structure which includes a U-shaped strap and a cooperating end bar, said means comprising a fixture adapted to be mounted on said end bar, a member slidably associated with said fixture, strap engaging means mounted on said member for movement into and out of engaging relationship with said strap, means for shifting the spacial relationship between said member and said fixture against the tension of the strap, two bearings in said fixture, each being disposed in substantial alignment with the end of said U-shaped strap, and a tool having a journaled portion adapted to be inserted into one or the other of said bearings and having a projection adapted to be projected into juxtaposition with an end of the strap for successively deforming first one end and then the other end

of said strap while it is maintained under tension so that said deformed ends will cooperate with said end bar to maintain the parts in tensioned relationship after said fixture is removed.

5. Apparatus for use in binding a sectional magnetic core structure provided with an end bar disposed along one surface of said core structure and projecting beyond the sides thereof, said end bar being provided with apertures at its projecting ends, and a U-shaped strap encircling the other three surfaces of said core structure and having its free ends projecting through said apertures comprising, a block adapted to rest on said end bar, strap engaging means slidably associated with said block, means for shifting the spacial relationship between said strap engaging means and said block to tension said strap and to cause the free ends thereof to be projected further through said apertures, two bearings in said block which are spaced from each other so as to be substantially aligned with said projecting ends of said strap when said block rests on said end bar, and means removably journaled in one of said bearings and having an eccentrically disposed projection for engaging one of said projecting ends at a point close to the surface of said end bar, whereby rotation of said means will cause a deformation of said projecting end at a point closely adjacent the surface of said end bar whereby the parts of said sectional core structure may be clamped together.

MARTIN B. GROUT.

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