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ADJUSTABLE COIL-WINDING CORE

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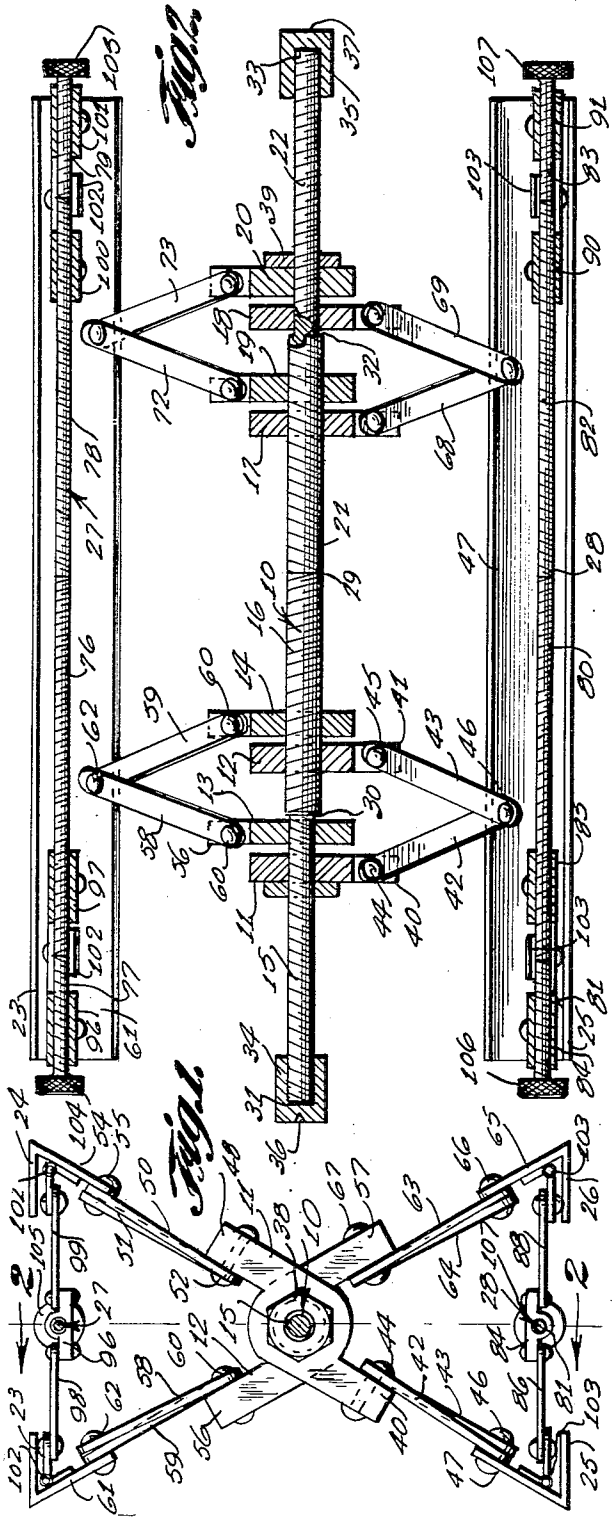


Fig. 1.

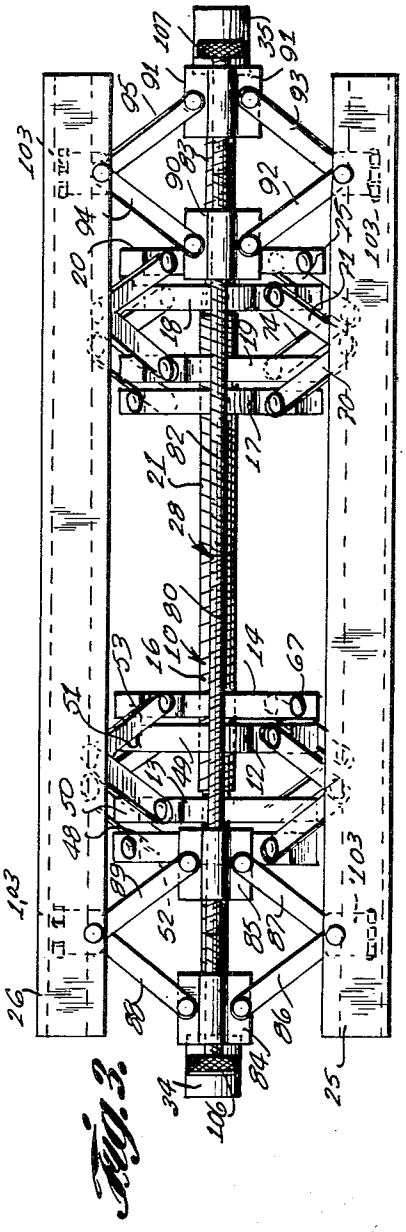


Fig. 3.

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ADJUSTABLE COIL-WINDING CORE

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1 Claim. (Cl. 140—92.2)

This invention relates to cores or mandrels such as used for winding wire and other products, and in particular, a core for winding electro-magnetic coils in which the cross section area thereof is adjustable so that the core may readily be set to wind coils of different sizes.

The purpose of this invention is to provide an adjustable frame adapted to be used as a core for winding coils for electro-magnets and the like in which both ends of the frame are adjusted simultaneously and with the same movement wherein the size is constant throughout the length thereof.

Mandrels, spools, drums and other devices have been provided with collapsible cores or with cylindrical walls thereof adjustable to different diameters, however, with such devices, it is difficult to adjust both ends at the same time and, consequently, it is difficult to form coils in which the diameter is constant throughout the length thereof.

With this thought in mind, this invention contemplates a frame formed with parallel longitudinally disposed bars in which the bars are mounted with toggle-acting links on a right- and left-hand threaded shaft, whereby both ends of the bars are accurately adjusted to equal dimensions.

The object of this invention is, therefore, to provide means for mounting parallel bars on a threaded shaft, whereby the bars are expanded and contracted simultaneously and with the cross sectional area of the device remaining constant throughout the length thereof.

Another object of the invention is to provide a collapsible or adjustable core for winding electro-magnet coils in which the device is adapted to be collapsed to facilitate removing coils therefrom.

A further object of the invention is to provide an adjustable coil-winding core in which the cross sectional area remains constant throughout the length thereof in the different positions and in which the core is of a simple and economical construction.

With these and other objects and advantages in view, the invention embodies an elongated threaded shaft having sets of right- and left-hand threads on both sides of a point midway of the length thereof with parallel bars mounted by links on pairs of hubs with the hubs positioned to straddle meeting ends of right- and left-hand threads on opposite sides of the center of the shaft for expanding and contracting said parallel bars in planes extended through the axis of the shaft, and in which similar means is provided for expanding and contracting the said parallel bars in planes parallel to and spaced from the shaft.

Other features and advantages of the invention will appear from the following description taken in connection with the drawing, wherein:

Figure 1 is an end elevational view showing the adjustable coil-winding core with the parts in extended positions.

Figure 2 is a longitudinal section through the core taken on line 2—2 of Figure 1.

Figure 3 is a view looking upwardly toward the lower side of the core.

Referring now to the drawing, wherein like reference characters denote corresponding parts, the improved adjustable coil-winding core of this invention includes a threaded shaft 10, pairs of hubs 11 and 12, and 13 and 14 positioned on right- and left-hand threaded sections 15 and 16, respectively, at one end, hubs 17 and 18 and 19 and 20 mounted on right- and left-hand threaded sections 21 and 22, respectively, at the opposite end, substantially L-shaped bars 23 and 24 at one side and 25 and 26 at the opposite side connected with toggle-acting links to the hubs and also connected with similar links to hubs on screws 27 and 28 on opposite sides of the core.

The threaded shaft 10 is divided into sections with right-hand threads 16 extended from a center point 29 to a shoulder 30 and with the left-hand threads 15 extended from the shoulder 30 to an end 31 forming one end of the shaft. The opposite end of the shaft is provided with a section 21 having left-hand threads extended from the center point 29 to a shoulder 32 and also with the section 22 having right-hand threads extended from the shoulder 32 to an end 33. The ends of the shaft are provided with blocks 34 and 35, respectively, the blocks being provided with flat sides and being center drilled to provide center-point recesses 36 and 37 to facilitate retaining the shaft in a lathe such as with one block held in a chuck in the head stock and the other on the center of the tail stock.

Lock nuts 38 and 39 are provided on the end sections 15 and 22 of the shaft for securing the hubs 11 and 18 in adjusted positions whereby the parts are adapted to be adjusted to form a coil of a predetermined size and after being adjusted to the size desired the parts are locked in the adjusted positions with the lock nuts.

The hubs 11 and 12 are provided with downwardly disposed flanges 40 and 41 to which links 42 and 43 are pivotally connected with pins 44 and 45, respectively, and the lower ends of the links are connected with a pin 46 to an upwardly extended flange 47 of the L-shaped bar 25. The hubs 11 and 12 are also provided with upwardly extended flanges 48 and 49 to which links 50 and 51 are pivotally connected with pins 52 and 53, respectively, and, as shown in Figure 1, the upper ends of the links 50 and 51 are connected to a flange 54 of the bar 24 with a pin 55.

The hubs 13 and 14, being similar to the hubs 11 and 12, are also provided with upwardly extended flanges, as indicated by the numeral 56, and lower or downwardly extended flanges 57 with links 58 and 59 being connected to the flanges 56 with pins 60 and to a flange 61 of the bar 23 with a pin 62. The flanges 57 of the hubs 13 and 14 are similarly connected with links 63 and 64 to a flange 65 extended from the bar 26 with the links connected to the flange 65 with a pin 66 and to the flanges 57 with pins 67.

The hubs 17 and 18 are connected, in a similar manner, with links 68 and 69 to the flange 47 and with links 70 and 71 to the flange 54; and the hubs 19 and 20 are conected with links 72 and 73 to the flange 61 and with similar links 74 and 75 to the flange 65. By this means, rotation of the threaded shaft 10 spreads and contracts the hubs whereby the links connecting the hubs to the L-shaped bars at the corners are spread to reduce the size of the core and contracted to increase the size of the core.

In this movement, the bars 23, 24, 25 and 26 are extended and contracted laterally and in order to provide supporting means for the bars the bars are connected to the screws 27 and 28 with links and hubs, similar to the links and hubs connecting the bars to the shaft 10 and,

in addition, the links are connected to the bars with hinges.

As illustrtaed in Figure 2, the screw **27** is formed with a section **76** having right-hand threads and a section **77** with left-hand threads, at one end, and the opposite end is provided with a similar section **78** having left-hand threads and a section **79** having right-hand threads. In the same manner, the screw **28** is provided with a section **80** having right-hand threads and a section **81** having left-hand threads and, at the opposite end, with a section **82** having left-hand threads and a section **83** having right-hand threads.

Hubs **84** and **85**, positioned on the sections **81** and **80** of the screw **28**, are connected to the bar **25** with links **86** and **87** and to the bar **26** with links **88** and **89** and similar hubs **90** and **91** on the sections **82** and **83**, respectively, are connected to the bar **25** with links **92** and **93** and to the bar **26** with similar links **94** and **95**.

The screw **27** is provided with right- and left-hand threaded sections, similar to the screw **28**, and hubs **96** and **97** at one end are connected with links **98** and **99** to the bars **23** and **24**, respectively, with similar hubs **100** and **101** on the end of the screw **27** at the opposite end of the core also connected to the bars **23** and **24** with links similar to the links **98** and **99**.

The links **98** and **99**, at both ends of the core, and also the links connecting the hubs **84**, **85**, **90** and **91** to the bars **25** and **26** at the opposite side are connected to the bars with hinges, such as the hinges **102** on the upper side and **103** on the lower side, whereby flexibility is provided in the connections to permit expansion and contraction in the parts thereof.

The ends of the screw **27** are provided with knurled knobs **104** and **105** and similar knobs **106** and **107** are provided on the ends of the screw **28**. By this means, the links connecting the bars **23** and **24** at one side and **25** and **26** at the other, may readily be actuated by hand to compensate for movements of the links connecting the bars to the shaft **10**.

With the parts assembled in this maner, the blocks or knobs **34** and **35** on the ends of the shaft **10** may be positioned in a chuck of a head stock and on a center of a

tail stock and with the L-shaped bars set to a predetermined size wire for a coil may be wrapped over the bars and after the coil is formed the bars may be collapsed to permit removal of the coil from the core.

It will be understood that although the core is described as being particularly adapted for wire for magnetic coils strips of material, bars or rods may be wrapped thereon and coils formed on the core may be used for other purposes.

It will be understood that modifications, within the scope of the appended claim, may be made in the design and arrangement of the parts without departing from the spirit of the invention.

What is claimed is:

A coil-winding core comprising a shaft having right- and left-hand threaded sections at each end, internally threaded hubs mounted on the sections of the shaft, upwardly and downwardly disposed flanges on said hubs extending from said hubs in opposite directions and in parallel planes, parallel bars spaced from the shaft, links connecting the parallel bars to the ends of the flanges on the hubs on the shaft whereby rotation of the shaft in one direction moves the bars away from the shaft and rotation of the shaft in the opposite direction draws the bars toward the shaft, screws having right- and left-hand threads thereon positioned between the bars on opposite sides of the shaft, hubs threaded on said screws and links connecting the hubs on the screws to adjacent parallel bars, said shaft having blocks with center recesses therein on ends thereof, said screws having knurled knobs on the ends, and hinges in the connections of the links of the screws to the parallel bars.

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