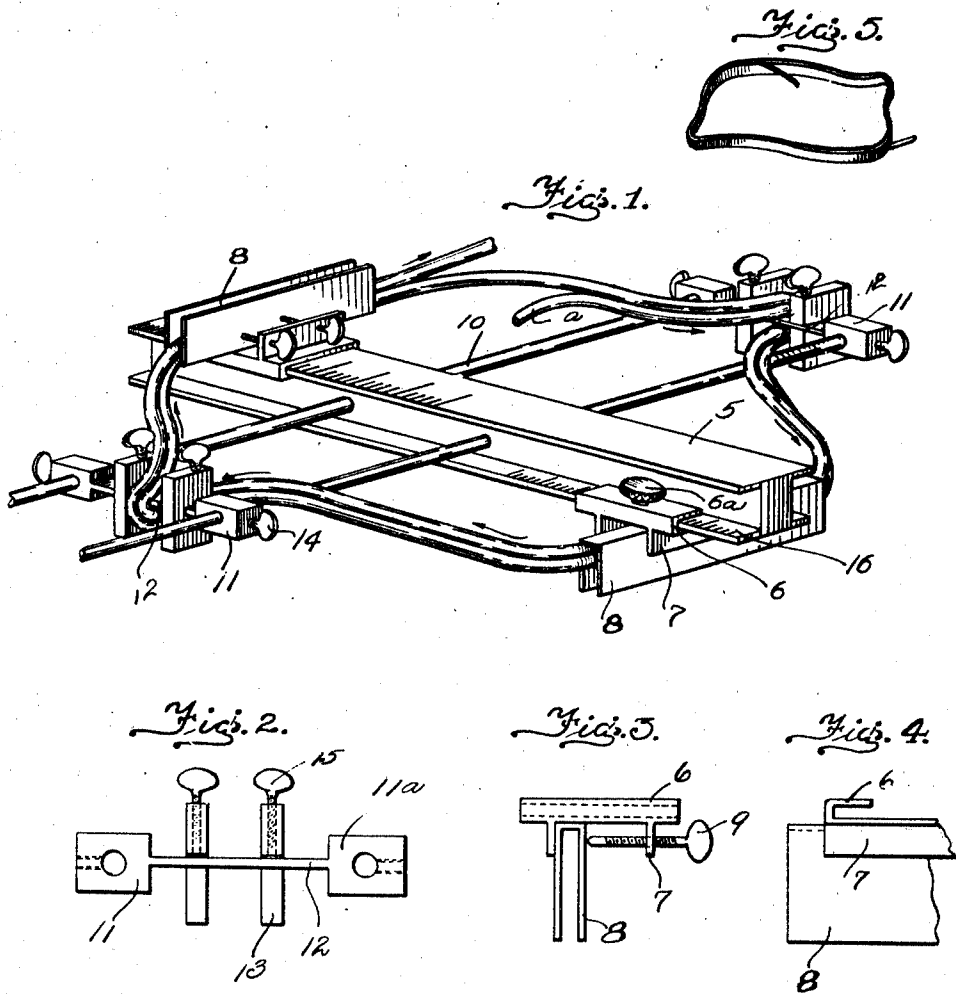


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COIL FORMING APPARATUS.
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Patented Mar. 23, 1920.



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To all whom it may concern:

Be it known that I, CHARLES KUBASTA, a subject of the Emperor of Austria, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Coil-Forming Apparatus, of which the following is a specification.

This invention relates to coil forming apparatus and more particularly to apparatus for winding and forming coils for armatures and stators of dynamos and electric motors.

The primary object of the invention is to provide a coil forming apparatus capable of forming the coils directly into the shape desired to fit onto the prepared cores of the armatures or stators.

A further object is to provide a coil forming apparatus readily adjustable to vary the length, width and thickness of the coil and to change the shape of the coil as desired, wherein the parts may be firmly secured in adjusted position to accurately maintain the desired shape and size.

Another object is to provide a coil forming apparatus of few and easily constructed parts that will be sufficient in operation and inexpensive to manufacture.

With the above and other objects in view which will readily appear as the invention is better understood, my invention consists in the novel construction, combination and arrangement of parts to be hereinafter more fully described and particularly pointed out in the appended claims.

Reference is to be had to the accompanying drawings illustrating a preferred embodiment of my invention and wherein similar reference numerals designate parts throughout the several views.

In the drawings:—

Figure 1 is a perspective view of my coil forming apparatus showing the position the wires assume during the formation of the coil;

Fig. 2 is a detail view of one of the longitudinal guide frames;

Fig. 3 is a detail side elevation of one of the lateral guide frames or wings;

Fig. 4 is a detail section of the lateral guide frame showing the flange which engages the bed of the apparatus, and

Fig. 5 is a perspective view of the coil

wound, with the guide frames in the position shown in Fig. 1.

In the drawings the numeral 5 designates a central member or bed which is preferably formed I-section in cross-section to give it rigidity and strength and at the same time provide upper and lower flanges on which may be adjustably secured the lateral guide frames or wings 6. The lateral guide frames are preferably formed substantially as shown, with an inner portion adapted to slide upon the flanges of the central member or bed 5, to which it may be secured in any adjusted position by thumb screws or other clamps 6^a. The wings 6 are shown with spaced outwardly-extending walls between which are mounted the U-shaped guides 8 through which the lateral portions of the wire coils are adapted to pass (see Figs. 1 and 3). In one or both of the walls 7 is threaded an adjusting bolt 9 whereby the U-shaped guide 8 may be firmly clamped in any desired position between the two walls 7. As the entire wing 6 is adjustable on the bed 5 and the U-shaped guide 8 is also adjustable between the walls 7 of the wings, it will be readily apparent that any desired lateral adjustment may be secured on my improved coil forming apparatus.

Firmly secured in the central bed 5 substantially centrally thereof are spaced parallel bars 10 extending from the central bed 5 at substantially right angles. On these parallel bars 10 are adjustably mounted the longitudinally guide frames 11, the positions of which may be adjusted at will to vary the distance between the inner portions of the coil in its longitudinal direction. These guide frames are preferably formed substantially as shown in Figs. 1 and 2, and have apertured side pieces 11^a adapted to slide over the parallel bars 10 and an intermediate flat spacing member 12 on which are slidably mounted a pair of auxiliary guides 13 which may be adjustably secured at will at any position between the slide members 11^a. With this construction it is apparent that the distances between the ends of the coil may be varied by sliding the guide frames 11 along the parallel bars and securing them in adjusted position by the thumb screws or clamps 14, while the position for the turn or bend in the wire coils is regulated by the adjustment of the auxil-

ary guides 13 which may be moved, as desired, between the apertured side members 11^a. These auxiliary guide frames 13 are also secured in adjusted position by thumb screws 15 or other forms of clamps, as desired.

From the above it will be seen that my coil forming apparatus primarily consists of a fixed central portion constructed somewhat in the shape of a cross, on each of the four arms of which is mounted an adjustable member, the positions of which may be adjusted at will to vary the dimensions of the coils in any direction.

In Fig. 1 I have secured the adjustable members in positions to form a wire coil of substantially the shape shown in Fig. 5, which shape is particularly adaptable for use with the ordinary cores used in armatures and stators of dynamos and electric motors now on the market. To secure this shape the terminal of the wire is placed substantially as shown at *a*, and thence passes over the upper surface of the spacing bar 12 of the right-hand side longitudinal guide frame 11 and is then bent to pass below the same spacing bar 12 and between the walls of the right-hand U-shaped guide 8, continuing below the spacing bar 12 of the left-hand longitudinal guide frame 11, and then bent upwardly and over the same spacing bar 12, whence it passes between the walls of the left-hand U-shaped guide member. This circuit is repeated as often as desired to form the coil. By adjusting the positions of the lateral wings 6 or the longitudinal guide frame 11, varied shapes and configurations of coils can be formed.

To enable the distances between the wings 6 to be readily determined and the wings positioned at any desired distance from the center, I have provided a graduated scale 16 on the flanges of the central bed 5. Similar markings may be placed on the parallel bars 10 to determine the spacing of the longitudinal guide frames 11 if desired.

While it will be apparent that the illustrated embodiment of my invention herein disclosed is well calculated to adequately fulfil the objects primarily stated, it is to be understood that the invention is susceptible to variation, modification and change without departing from the spirit and scope of the invention as set forth in the subjoined claims.

Having described my invention, I claim:

1. A coil forming apparatus comprising a central bed substantially of I-shaped cross section, a pair of guide frames adjustably

mounted thereon, means for securing said guide frames to the bed in any adjusted position, a pair of spaced members secured to the central bed and extending on each side thereof, and guide frames adjustably mounted on said spaced members.

2. A coil forming apparatus comprising a central bed substantially of I-shaped cross section, a pair of guide frames slidably mounted thereon, means for securing said guide frames to the bed in any adjusted position, a pair of spaced members secured to the central bed and extending on each side thereof, and guide frames slidably mounted on said spaced members.

3. A coil forming apparatus comprising a central bed, lateral guide frames mounted to slide thereon, each of said lateral frames having spaced walls, auxiliary guide frames adjustably mounted between said walls, spaced parallel bars extending from the central bed in opposite directions, and longitudinal guide frames adjustably mounted on said parallel bars.

4. A coil forming apparatus comprising a central bed, lateral guide frames mounted to slide thereon, each of said lateral frames having spaced walls, auxiliary guide frames adjustably mounted between said walls, means for securing the adjustable guide frames in any position intermediate said walls, spaced parallel bars extending from the central bed in opposite directions, and longitudinal guide frames adjustably mounted on said parallel bars.

5. A coil forming apparatus comprising a central bed, lateral guide frames adjustably mounted thereon, a pair of spaced parallel bars extending from the central portion of the bed in opposite directions, a pair of longitudinal guide frames adjustably mounted on said parallel bars, and auxiliary guides adjustably mounted on each of the longitudinal guide frames.

6. A coil forming apparatus comprising a central bed, lateral guide frames adjustably mounted thereon, a pair of spaced parallel bars extending from the central portion of the bed in opposite directions, a pair of longitudinal guide frames adjustably mounted on said parallel bars, auxiliary guides mounted to slide on each of the longitudinal guide frames, and means for securing each of the auxiliary guides in any adjusted position.

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