April 26, 1949. E. F. MUELLER 2,468,223

COIL FORMING JIG

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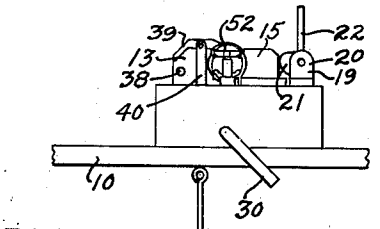


FIG. 1.

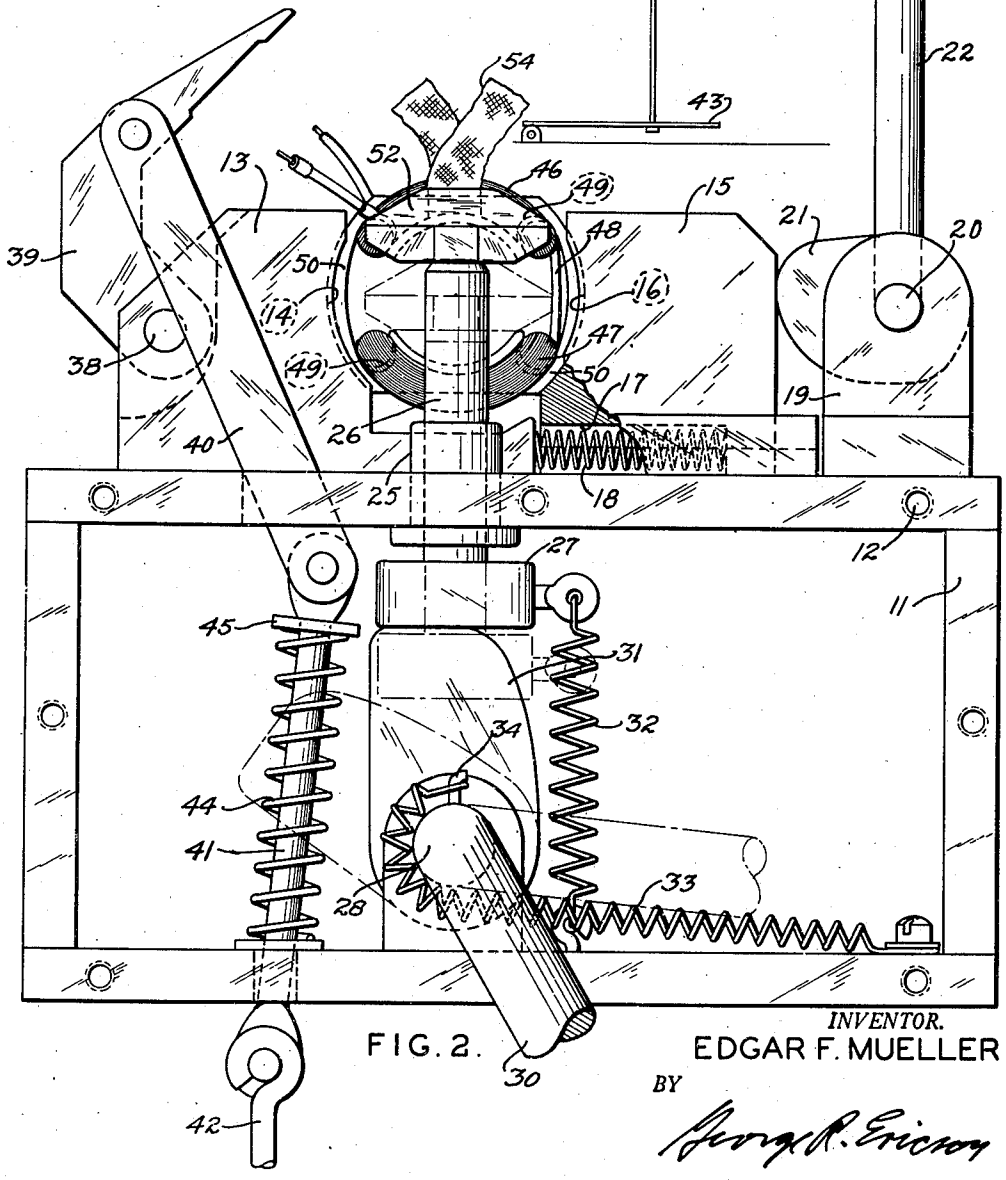


FIG. 2.

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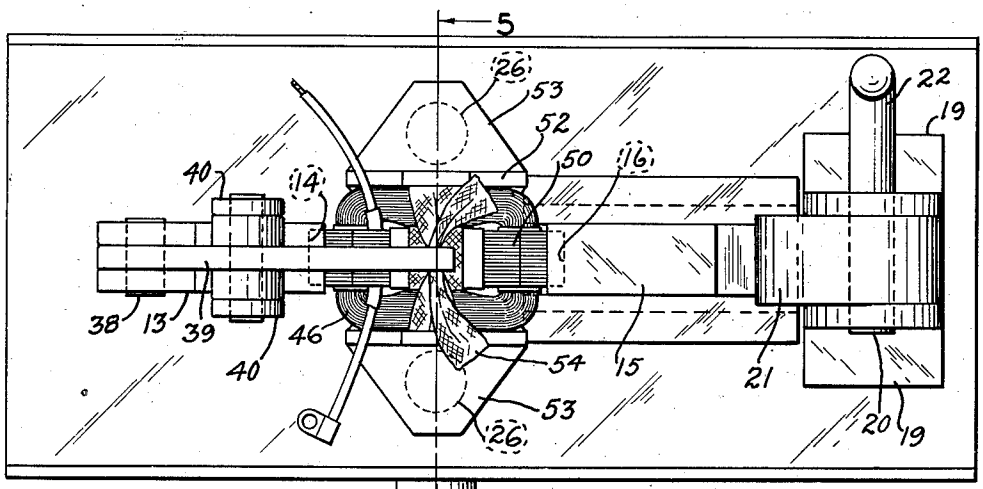


FIG. 3.

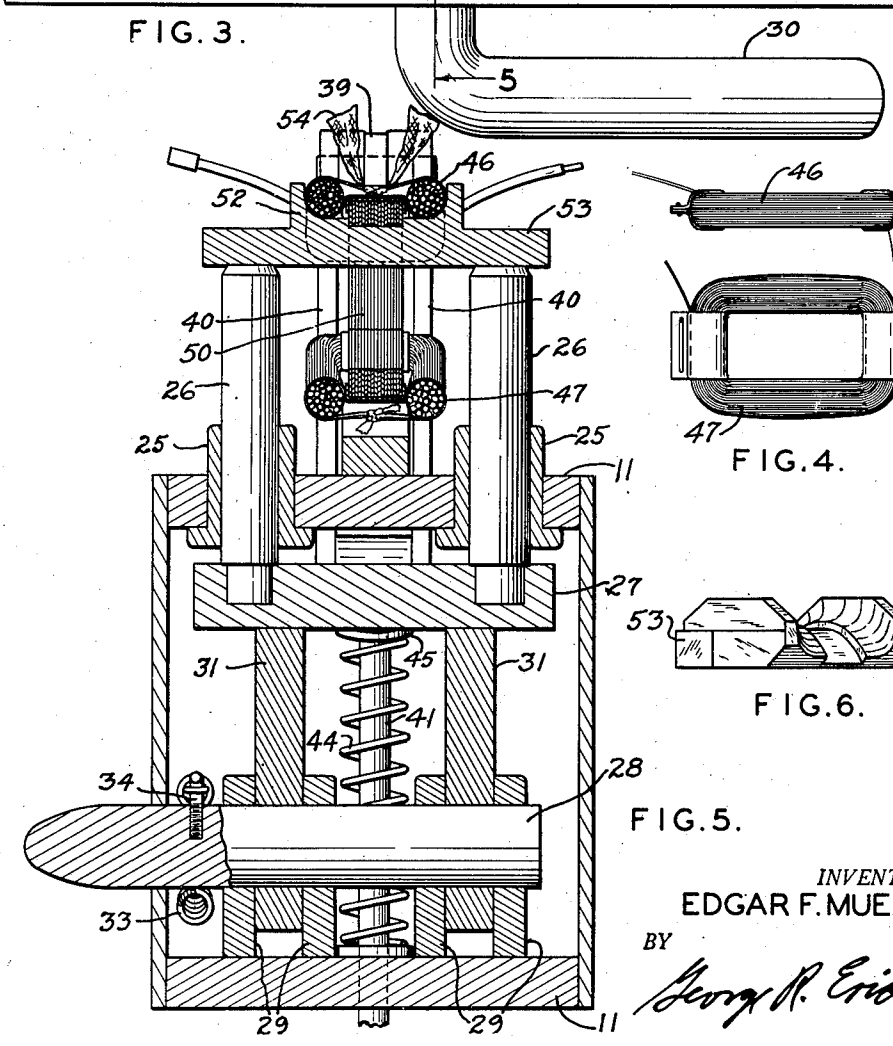


FIG. 4.

FIG. 6.

FIG. 5.

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COIL FORMING JIG

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2 Claims. (Cl. 153—48)

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This invention relates to jigs for forming motor field coils and for fixing the coils in a formed position relative to the field frame.

An object of the invention is to provide such a jig for facilitating the rapid and compact formation and fixing of field coils mounted on rigid core forming frames. The invention is particularly useful in the formation of coils for small electric motors in which the shaping of the coils to conform with the usual arcuate field frame and tying of the coils to the frame compactly are difficult and tedious operations when performed by hand.

In the accompanying drawings which illustrate the invention,

Fig. 1 is a side view of the device mounted on a work bench.

Fig. 2 is an enlarged side view of the jig with the side plate removed for clearer illustration and showing a field coil clamped in position.

Fig. 3 is a top view of the structure in Fig. 2.

Fig. 4 is a view of a pair of connected coils before application to the field frame.

Fig. 5 is a section on line 5—5 of Fig. 3, and

Fig. 6 is a perspective view of the forming and holding die.

Fig. 1 shows a work bench 10 having the novel jig mounted thereon. As better shown in Figs. 2, 3 and 4, the jig comprises a base forming frame 11 having holes 12 for attachment of side plates. A stationary clamping jaw 13 projecting from the upper surface of the base has an inner, arcuate, recessed surface 14 facing a movable jaw 15 having similar clamping surface 16. The under surface of jaw 15 is recessed at 17 for receiving a coiled spring 18 constantly urging the movable jaw toward the right hand or retracted position. A pair of lugs 19 adjacent the movable jaw rotatably receive a pin 20 to which there is rigidly affixed a cam 21 positioned to engage the rear face of the movable jaw, upon rotation of the cam, to urge the jaw leftwardly toward its clamping position. Pin 20 is extended at 22 to form a cam actuating handle.

Vertically slidable in bushings 25 at the sides of the space between jaws 13 and 15, are a pair of plungers 26 attached at their lower extremities to a plate 27. A shaft 28 is rotatably mounted in bearing lugs 29 projecting from the bottom of the base member and has a handle forming extension 30. A pair of cams 31 are rigidly mounted on shaft 28 between the pairs of lugs 29 and are in position to engage plate 27, upon rotation of the cams, to urge the plate and the plunger 26 upwardly. A coiled spring 32 constantly urges the

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plate and plungers downwardly against cams 31. A second coiled spring 33, connected to a pin 34 projecting from shaft 28, tends to rotate the shaft and cams 31 counterclockwise or in the direction to permit lowering or retraction of plunger 26 by spring 32.

Pivoted on stationary jaw 13 by means of a pin 38 is an angular finger 39 to the central portion of which there is connected the arm of a bifurcated link 40 which extends through the top of base framing 11 and is connected to the upper extremity of a second link 41 extending downwardly through the bottom of the framing. A third link 42 connects link 41 to a treadle 43 beneath bench 10. A coiled spring 44 is compressed between the bottom of frame member 11 and a collar 45 on link 41 and constantly urges the three links upwardly and finger 39 counterclockwise to the retracted position shown in Fig. 2.

In the use of the device, a pair of motor field coils 46 and 47, serially connected as at 48, and mounted in the usual receiving slots 49 in laminated field frame 50, are inserted between jaws 13 and 15. Cam 21 is then rotated counter-clockwise by means of handle 22 to securely clamp the field frame in position. A forming die 52, best shown in Fig. 6, is then inserted between the jaws and through the central opening in the field frame with the wing-like extremities 53 of its flat undersurface resting on the upper extremities of plungers 26 which are in their retracted positions, as indicated in broken lines in Fig. 2. A tying ribbon or string 54 is then wrapped about upper coil 46 and loosely tied in a single knot. Next, handle 30 is rotated clockwise to lift plate 27 and plungers 26 and thereby apply upward pressure to the die for forming coil 46 in the desired arcuate shape snugly against frame 50. Cams 21 and 31 are of such shape that in their pressure applying positions, as shown in Fig. 2, they are self holding so that the hands of the operator are free to knot coil fixing tie 54. After a single knot is tied in ribbon 54 and drawn tightly about the coils, the operator, while retaining his hold on the ends of tie 54, presses treadle 43 to bring tie-holding finger 39 against the knot, as in Figs. 1, 3 and 5, whereupon a second knot may be formed in the tie for securing the same position. The foot is then removed from the treadle, permitting retraction of finger 39 by spring 44, cam 31 is rotated counterclockwise to lower plungers 26, die 52 is removed, and cam 21 is rotated clockwise permitting retraction of the movable jaw by spring 18, whereupon the

frame may be reversed and the operation repeated on other coil 47.

The coils are thus accurately and snugly fitted to the frame and securely fixed in position when ultimately removed from the jig. The speed of the tying operation is, thus, greatly increased, and the neatness of the finished product enhanced.

The exclusive use of all modifications as come within the scope of the appended claims is contemplated.

I claim:

1. A jig for forming a motor field coil on a closed frame comprising holding jaws, at least one being resiliently movable for receiving the coil frame, a cam mounted adjacent said movable jaw and rotatable to move said jaw to its clamping position, spring means for retracting said jaw from said position, spaced plungers disposed transversely between said jaws for receiving the coil frame therebetween; a die insertable through a clamped coil frame, a cam mounted for rotation to advance said plungers and move said die for applying forming pressure to the coil against the frame, and a spring for retracting said plungers, said cams being self holding in their pressure applying positions.

2. Apparatus for forming motor field coils on a frame comprising frame holding jaws, at least one being movable for receiving the coil frame, mechanism mounted adjacent said movable jaw and cooperable therewith to move the same to and from its clamping position, spaced plungers disposed transversely between said jaws, a die insertable through a clamped coil frame and having portions for operatively receiving said plungers, and mechanism mounted adjacent said plungers and cooperable therewith to move the same to and from its position for applying forming pressure to the coil against the frame, said jaw and plunger moving mechanism being self-holding in their pressure applying position.

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REFERENCES CITED

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

UNITED STATES PATENTS

Number	Name	Date
373,743	Kent	Nov. 22, 1887
524,330	Lane	Aug. 14, 1894
1,045,996	McLean	Dec. 31, 1912
1,306,426	Graves	June 10, 1919
1,450,373	Jones	Apr. 3, 1923
1,506,641	Hunk et al.	Aug. 26, 1924
1,538,187	Herrick	May 19, 1925
1,720,133	LeRoy	July 9, 1929
2,055,175	Franz	Sept. 22, 1936

FOREIGN PATENTS

Number	Country	Date
716,902	France	Dec. 30, 1931