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G. B. SAYRE

SECURING ARMATURE COILS

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Fig. 1.

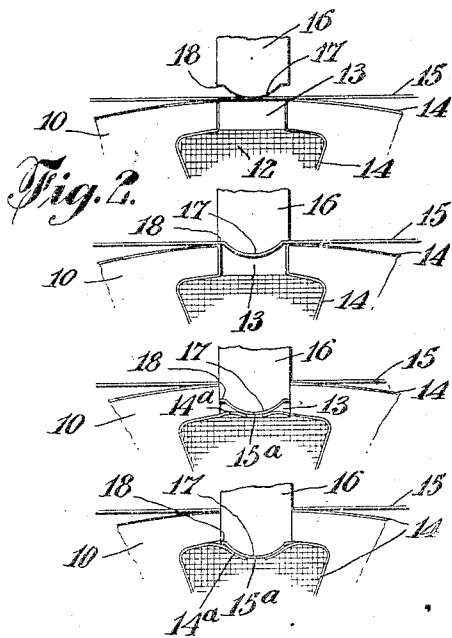
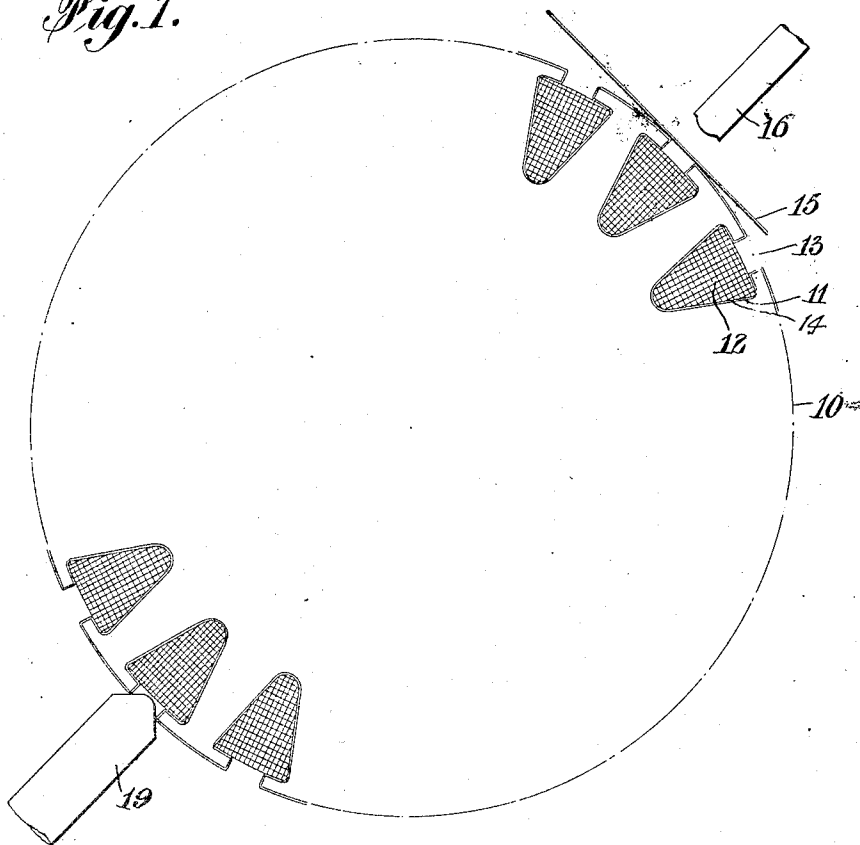
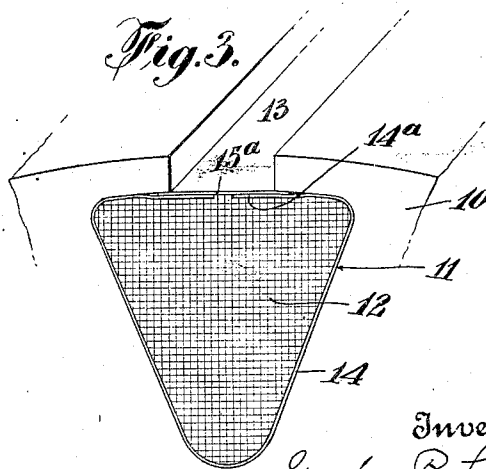


Fig. 3.



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UNITED STATES PATENT OFFICE.

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SECURING ARMATURE COILS.

Application filed November 29, 1924. Serial No. 752,898.

To all whom it may concern:

Be it known that I, GORDON B. SAYRE, a citizen of the United States, and a resident of Syracuse, Onondaga County, New York, have invented an Improvement in Securing Armature Coils, of which the following is a specification.

My invention relates to a method of and means for securing coils in armatures or the like. Many of these armatures, particularly of the smaller sizes, are made with what are called peripheral teeth, that is to say they are provided with a series of recesses near the circumferential surface, which recesses have narrow throats, and in which are placed the armature coils. It is a common practice to line the recesses and teeth with a thin insulator, usually paper, and this as a matter of convenience is generally made continuous so as to extend around the surface of the recesses and over the teeth, and it is easier to do this than to use a separate strip for each individual recess. After the coils are placed in position between the teeth, that is in the recesses, they are usually fixed by means of a wooden wedge. This system is rather slow and expensive and not entirely satisfactory, because the wedges sometimes get loose. My invention is intended to provide a much quicker, simpler and cheaper method and means of securing the coils, and also to provide means for securing them so that they are not likely to become loose.

In carrying out this idea, I provide a strip of material which is springy and insulating, and which is usually one of the well known insulating fibres. This is fed opposite the throats of the several recesses, and as it passes each throat, I punch from the strip a section of the material which is forced inward through the throat and against the resistance of the coil, and as the punch is of the same width as the throat, it shears the paper from the throat, pushes the severed strip in through the throat by reason of bending it lengthwise, and the coil will yield sufficiently to permit the severed strip to be inserted through the throat and to the outer part of the recess, at which point the strip expands so as to extend beyond the throat shoulders, and it is securely held in place by the reaction or resilience of the coil when the punch is removed. In this way the strips can be inserted step by step, that is recess by recess, very rapidly and economically, and

the resilient fastening is a great improvement on the ordinary wedge.

Reference is to be had to the accompanying drawings forming a part of this specification, in which similar reference characters indicate corresponding parts in all the views.

Figure 1 is a diagrammatic elevation of a part of an armature showing my invention.

Figure 2 is a detail diagrammatic view showing the manner in which a fastening strip is cut from the main piece, bent, pushed through the throat, and secured against the outer part of the coil, and

Figure 3 is a broken enlarged detail perspective view showing the structure more clearly.

The armature 10 may be of any approved kind, and in Figure 1 I have shown it merely in outline, but it is of the type which has peripheral recesses 11 extending across the face, and in which the coils 12 are placed. The recesses have throats 13 opening outward through the peripheral wall of the armature, and the shape of the recesses is conventional, leaving abrupt shoulders at the inner end of the throats 13, but the contour of the recesses themselves is of course immaterial.

Before the coils 12 are formed in the recesses, these are usually lined with sheet insulation 14, which is generally paper, and as a matter of economy in time and convenience of arrangement, the strip is usually extended around the wall of each recess, then over the adjacent top to the next recess, and so on around the armature. After the coil is fastened in place, it is desirable to remove the paper from the throat 13 and from the outer face of the armature.

By my improvements I am enabled to have the paper 14 and the coils 12 placed in the several recesses in the usual or any preferred manner, but my method of fastening is as follows. A strip of sheet material 15, preferably insulating fibre of desired stiffness, is fed across the several throats 13 one by one, as shown in Figure 1. The punch 16 is shaped to exactly fit each throat 13, but has its middle portion convex as shown at 17, leaving a shoulder 18 at each side of the convex part. Consequently by referring to Figure 2 it will be seen that when the part 17 strikes the sheet 15, it will first bend a section as shown at 15^a, and as the punch advances further it will sever a strip from the

sheet 15 as shown in Figure 2, and ultimately will push the strip below the shoulder of the throat 13 and into the corresponding recess 11. As this action occurs, the coil 12 will yield under the impact of the punch so as to permit the strip 15^a to pass through the throat 13, and as soon as this occurs the side edges of the strip will spring beneath the shoulders of the throat 13, and as the punch is removed, the tension of the coil 12 will hold the strip 15^a securely in place and in a manner to effectually seal the throat 13.

Moreover it will be observed that when the shoulders 18 pass through the throat 13 they will shear off the insulating paper 14 at the entrance to each side of the throat 13, and the inner parts of the paper will fold beneath the strip 15^a as shown at 14^a in Figure 3, and these loose ends will be firmly held between the coil and the strip 15^a.

I have not shown the means for stepping forward the sheet 15, or for operating the punch 16, as the sheet feed and punch operating mechanisms are so thoroughly known in the art, and moreover any of the usual feeding and punching devices can be used. In carrying out the invention, however, it is desirable to use a detent 19 which will engage one of the throats 13 while the punch 16 is operating in another, and the means for doing this it is not necessary to show because it is the most ordinary shop practice. It is essential to have the face of the punch 16 shaped substantially as indicated, however, that is to have a convex part which will bend the fastening strip 15^a before the shoulders of the punch begin to shear the strip and shear the paper 14. So far as the operation of the punch is concerned, it will be seen that the walls of each throat 13 serve as one member of a die, the punch forming the other member, and it will be further understood that there is a very substantial resistance by the coil 12 to the final movement of the punch 16, so that the reaction of the coil is sufficient to bind the strip 15^a firmly between the coils and the adjacent walls of the recess 11, and thus there is no danger of the strip being forced out, while at the same time it secures the coil against displacement.

I claim:—

1. The combination with an armature having recesses with peripheral throats narrower than the recesses, of coils in said recesses, and insulating strips extending the full length of the throats and overlapping the inner walls thereof so as to lie between the coils and the outer recess walls thereby sealing the throats for their full length.

2. The improvement in the art of securing armature coils in armature recesses having

peripheral throats, which consists in forcing inward through the throats and against the coil sealing strips which are wider than the throat by bending the strips longitudinally and permitting them to expand after passing through the throat thereby overlapping the inner edges of the throat.

3. The improvement in the art of securing armature coils in recesses having peripheral throats, which consists in forcing a strip of springy fibrous material wider than the throat through the throat by bending the material lengthwise, forcing the bent strip against the tension of the coil in the recess, and then permitting the expansion and straightening of the strip which causes it to be bound between the coil and the outer wall of the recess thereby covering and sealing the throat.

4. The improvement in the art of securing armature coils in recesses having peripheral throats, which consists in punching from an insulating sheet successive strips of material wider than the adjacent armature throat and at the same time causing the punch to force the severed strip through the adjacent throat and against the tension of the contained coil in the adjacent recess, which act bends the strip lengthwise, then withdrawing the punch and permitting the strip to expand so as to close the inner end of the throat.

5. The improvement in the art of securing armature coils in recesses having peripheral throats and in which the walls of the recesses and throats are lined with sheet insulating material, which consists in forcing a strip of insulating material through the throat and against the tension of the coil by means of a punch or die shaped to bend the strip lengthwise and shear the sheet insulator from the throat walls whereby the expansion and straightening of the bent strip causes it to seal the inner end of the throat on the withdrawal of the punch and to be positioned by the pressure of the coil against it.

6. The improvement in the art of securing coils in armatures having recesses with peripheral throats and with the throats and recesses lined with insulating paper, which consists in simultaneously bending lengthwise and forcing through the throat a fastening strip, shearing the paper from the throat, and then withdrawing the pressure from the strip thereby permitting it to expand and seal the inner end of the throat.

In testimony whereof, I have signed my name to this specification this 26th day of November, 1924.

GORDON B. SAYRE.