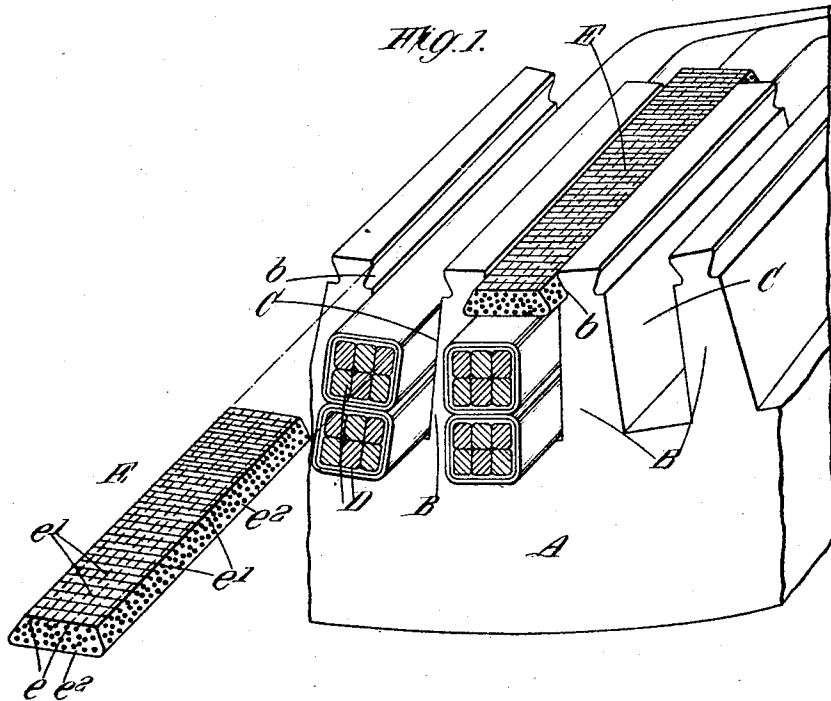
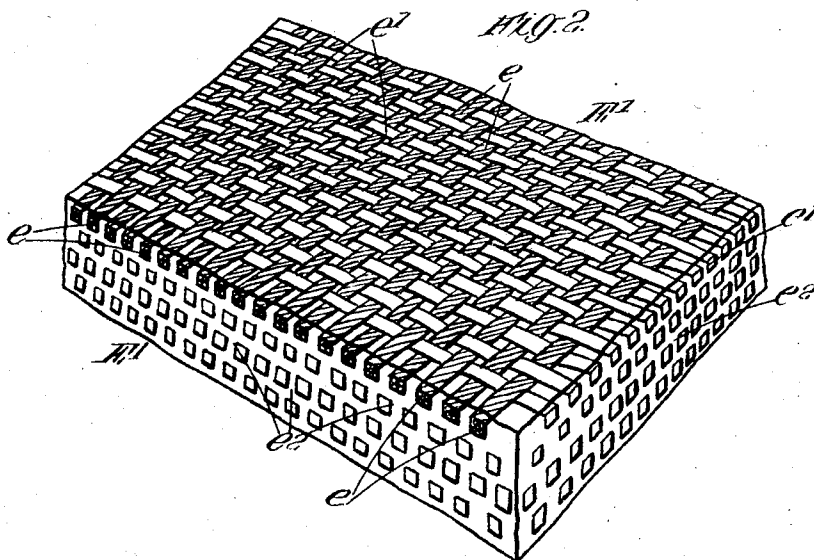


Nov. 2, 1926.

1,605,112

P. HUGGINS
SLOT CLOSING STRIP FOR SLOTTED COIL CARRYING MEMBERS OF DYNAMO
ELECTRIC MACHINES
Filed April 23, 1926



Inventor
Perry Huggins
By James Davis Martin, Clerk
Attorney

UNITED STATES PATENT OFFICE.

PERCY HUGGINS, OF WAKEFIELD, ENGLAND, ASSIGNOR OF ONE-HALF TO DIAMOND COAL-CUTTER COMPANY LIMITED, OF WAKEFIELD, ENGLAND.

SLOT-CLOSING STRIP FOR SLOTTED COIL-CARRYING MEMBERS OF DYNAMO-ELECTRIC MACHINES.

Application filed April 23, 1926. Serial No. 104,199, and in Great Britain February 28, 1925.

This invention relates to slot closing strips for slotted coil carrying members of dynamo-electric machines, more particularly the motors used for coal-cutting purposes but also other types of machine. In the manufacture of dynamo-electric machines it is found advantageous to assemble their windings in cores or bodies having slots completely open at the periphery and then to close the mouth of each slot by a strip or wedge of magnetic material. One object of the invention is to provide a wedge of this type in which the magnetic material, such as iron, provides a continuous magnetic path across the gap, but a discontinuous metallic or conducting layer along the gap. Another object is to concentrate the magnetic material only at the portion near or immediately under the surface at the air gap so as to avoid undue leakage of magnetic flux. A further object is to enable the strip or wedge to be made in an economical manner by a weaving process in which the magnetic material is in the form of wires or strands woven with strands of insulating material (for example, hemp, cotton yarn or the like) so as to extend transversely when the strip is formed, while the portion of the strip behind the layer of magnetic material may be made by means of woven layers or layers of fibrous or other nonconducting material.

The wires or strands of ferrous nature (that is, of high magnetic permeability) are arranged in the wedge so as to extend across the slot, directly or in a slanting manner. The arrangement of wires of high permeability therefore decreases the magnetic reluctance across the slot opening but the production of eddy currents in the wedge is substantially eliminated owing to the discontinuity of the metallic parts of the wedge along the slot. The mixed fabric may be made solid by treatment with suitable insulating material which causes the strands to become embedded and insulated from each other. The fabric may be woven in sheets which are subsequently cut up into widths suitable for the wedges; or strips of the desired width may be made directly.

In order that the said invention may be clearly understood and readily carried into effect the same will be more fully described

with reference to the accompanying drawings, in which:—

Figure 1 is a perspective view of a portion of the armature or other member, showing slots and closing wedges according to this invention; and

Figure 2 illustrates a method of making fabric suitable for the strips or wedges.

A represents the armature body or core, or the body of the primary of an induction motor or stator of a revolving field alternator, or other equivalent slotted member carrying windings. It will be referred to for convenience as a core. B, B are the teeth on the periphery of the core and forming slots C which receive the windings D. E is the closing strip.

The slot strips E effect the closing of the magnetic circuit between the teeth B and the enclosing of the windings in their slots, while as the iron of the strips is not continuous along a section or plane parallel to the length of the slots, the strips will be substantially free from eddy currents. In the arrangement shown the strips are retained in place in known manner by the opposing grooves *b* in the teeth immediately inside their periphery. The strips form a close fit between the grooves, as shown in Figure 1, and may be pushed in from one end of the slots and, if found desirable, may be tightened in by suitably applied pressure causing their expansion. Such pressure may not, however, be necessary with suitable formation of the strips and the slot grooves. The strip E is composed of an outer layer comprising cross wires *e* of ferrous or magnetizable metal woven with strands *e'* of insulating material, such as hemp, cotton yarn or the like. Only the surface layer or portion of the closing member is provided with a content of magnetizable wires *e*, the remaining layers or portion *e'* being unprovided with magnetizable material. The wires *e* may be laid together side by side or may extend in one or more directions; the strands of insulating material *e'* may also lie in one or more directions and may be interwoven, with the lower layer or layers *e'* consisting entirely of insulating material. Or the layers if separately made may be caused to adhere together. The thickness of the strip or wedge required for mechanical

reasons is unnecessarily large for magnetic considerations if the magnetic component is distributed throughout the thickness as only the portion immediately adjacent to the air gap carries useful flux, the rear part, if magnetizable, providing a path for leakage flux and this is avoided in the wedge construction illustrated.

The non-conducting back portion e^2 of the strip E may be of woven or non-woven type, as for example fibre board or a phenolic condensation product. The complete material if woven is ultimately made compact and solid by treatment with suitable insulating material (such as a synthetic condensation product of a phenol and formaldehyde) in which the strands are embedded. The metal wires e may be single or stranded, with the strands insulated by varnishing, ename-

ling or oxidizing.

In Figure 2 a strip of fabric E' from which a strip E is cut is illustrated, comprising magnetic metal wires or filaments e woven with insulating strands e' and embedded in insulating substance e^2 . The material may be made in sheets of any desired

size and cut into strips of the width desired. Several layers of woven strands are shown in the example to form the surface magnetic layer and the backing layer e^2 but the thickness and number of layers would depend on the requirements.

What I claim and desire to secure by Letters Patent of the United States is:—

1. A closing strip for the slots of a slotted coil carrying member of an electrical apparatus comprising a body of insulating material having spaced magnetic elements extending across the slot opening and embedded in a surface layer only of said body of insulating material.

2. A closing strip for the slots of a slotted coil carrying member of an electrical apparatus comprising a body of insulating material having embedded therein a plurality of layers of woven insulating material, and a surface layer of woven material embedded in said body of insulating material and comprising insulating strands interwoven with magnetic elements which extend across the slot opening.

PERCY HUGGINS.