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GERMAN SILVER ELECTROCARDIOGRAPH CONTACT ELECTRODE

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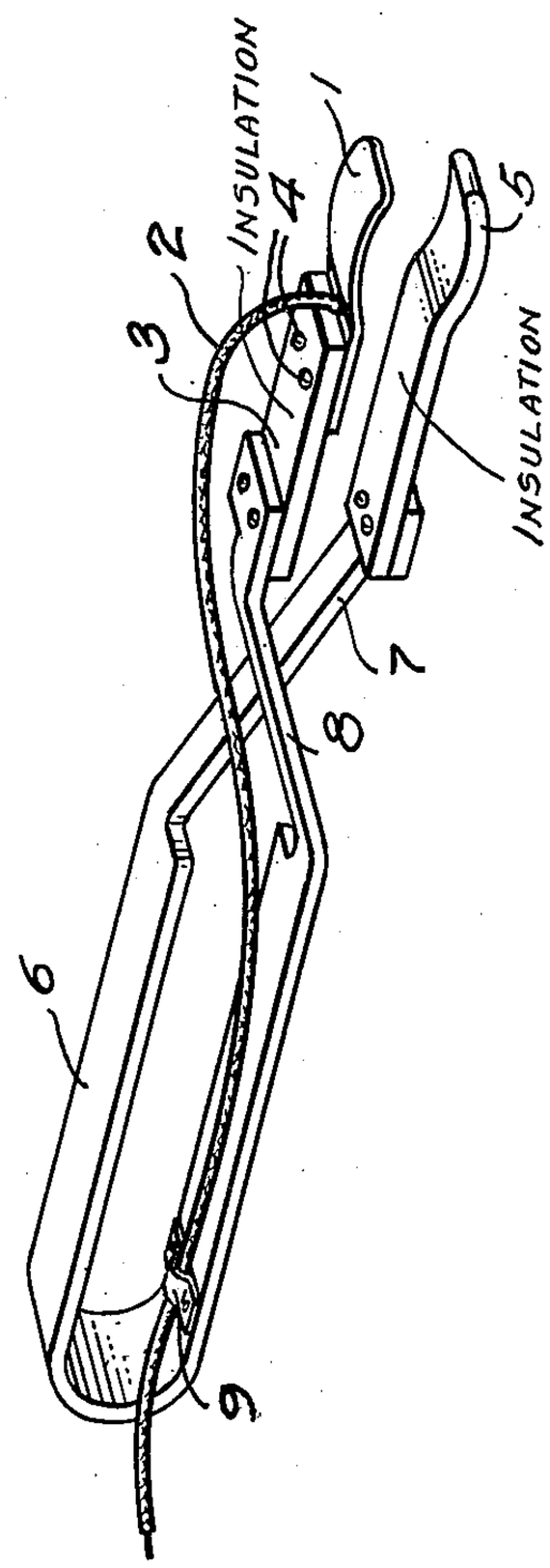

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GERMAN SILVER ELECTROCARDIOGRAPH CONTACT ELECTRODE

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1 Claim. (Cl. 128—418)

(Granted under the act of March 3, 1883, as amended April 30, 1928; 370 O. G. 757)

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The invention described herein may be manufactured and used by or for the Government of the United States for governmental purposes without the payment to me of any royalty thereon in accordance with the provisions of the act of April 30, 1928 (Ch. 460, 45 Stat. L. 467).

This invention relates to a self-tensioning electrode for electrocardiographs, and more particularly to such an electrode adapted to be used in connection with small experimental animals, such as for example, rats, mice, cats, dogs or the like.

Heretofore in the making of electrocardiograms of small animals during research procedures, various expedients such as fine needles inserted subcutaneously, or tight wrappings of wire or the like, have been attempted to be used, but the resulting pain and discomfort to the animal has resulted in the production of unsatisfactory electrocardiograms or in interferences, artefacts and distortions which are undesirable. This invention accordingly has for an object the production of an electrode adapted to engage the limb of a small animal with a minimum of pain and discomfort while at the same time being capable of providing an intimate electrical contact capable of transferring the minute currents generated by the animal heart during its normal functioning. Other objects will be apparent or will appear hereinafter as the ensuing description proceeds.

These objects are accomplished in accordance with this invention which provides a self-tensioning electrode for electrocardiograph machines wherein a German-silver contact member is provided with a shielded electrical insulating lead and opposed to said contact member there is provided an insulating clamping member adapted for movement toward and away from said contact member, the two members being connected to each other through a U-shaped spring having a pair of double-offset fingers, said spring urging said fingers toward each other, one of said fingers being connected to said clamping member and the other finger being connected through an insulating block to said contact member whereby said spring upon expansion urges said clamping member toward said contact member and the limb of a small animal engaged between said members can be uniformly pressed by the contact member.

For a better understanding of this invention, reference is made to the single figure of the accompanying drawing wherein is shown an isometric view of a device in accordance with this invention. For a practical embodiment of

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this invention, and referring now to the drawing, there is provided electrical contacting means for engaging the limb of a rat or the like which may take the form of a flat contact member 1 having a generally arcuate surface. The contact member 1 is preferably made of a metal which has a low electrical resistance and which is not corroded by the usual salt pastes employed for securing electrical conductivity. It has been found that German-silver, an alloy composed of about 18% nickel, 56% copper and 26% zinc, is eminently suited for this purpose. Connected to the contact member 1 is an insulated and shielded copper wire 2 of a size adapted to carry the minute currents of electricity contemplated. In general it has been found that the wire 2 may be of the type such as is used for phonograph pick-up arm cable or any other suitable electrical conductor may be employed. The wire 2 is retained in electrical contact with the member 1 by means of a block of insulation 3 and a pair of retaining screws 4.

Adjacent to the contact member 1 and the block 3 is a clamping member 5 which is at its outer extremity shaped in an arcuate fashion to form a mirror image of the contact member 1. The clamping member 5 is made of a suitable electrically insulating material and is adapted to move toward and away from the contact member 1. Connected to the clamping member 5 and the contact member 1 through the block 3 is a flat U-shaped spring 6 having a pair of double-offset fingers 7 and 8 which, upon release of the spring 6 are adapted to urge the contact member 1 and the clamping member 5 toward each other with a tension adapted to secure good electrical contact while at the same time insufficient to injure an experimental animal. For convenience, the wire 2 may be retained at a point intermediate its length by strap 9 fastened to the spring 6 near the apex of the U. From this point the wire 2 is connected to the amplifier of an electrocardiograph machine, not shown, in the customary manner.

In the operation of the device, it is only necessary to compress the spring 6 whereby the contact member which is separated from the clamping member 5 and the paw or limb of the experimental animal is inserted therebetween. Upon release of the spring 6, the limb is closely engaged by the clamping member 5 and the contact 1. If desired, any of the usual electropastes may be employed to secure a more efficient contact between the limb of the animal and the electrode.

Various changes can be made in the details of the invention as above described without departing from its spirit and scope, as defined in the appended claim as ultimately allowed.

What is claimed is:

A self-tensioning electrode for electrocardiographs which comprises a single German-silver contact member, an electrical lead directly connected thereto, an electrically insulated clamping member opposed to said contact member and adapted for movement toward and away from said contact member, and a U-shaped spring having a pair of double-offset fingers, one of said fingers being connected to said clamping member and the other finger being connected, through insulation, to said contact member, said spring being adapted to urge said clamping member toward said contact member, whereby said contact member is adapted to be uniformly pressed against the limb of a small animal engaged between said members.

LOUIS J. PECORA.

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