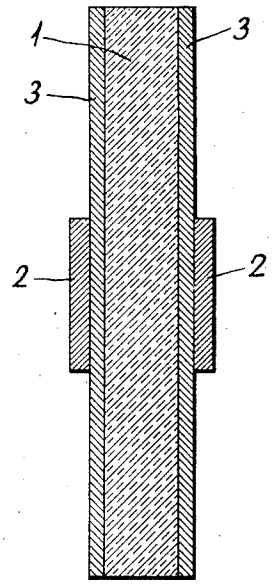
Feb. 11, 1941. E. GERLACH 2,231,159

PIEZOELECTRIC DEVICE

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PIEZOELECTRIC DEVICE

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1 Claim. (Cl. 171—327)

This invention relates to a new sound device, more especially to a microphone.

As is known, certain crystals reveal a piezoelectric effect, i. e. electric tensions are produced when they are subjected to a compression or tension and, vice versa, deformations of the crystal occur when applying thereto electric tensions. Now, it was found that also rubber placed between two electrodes produces considerable electric tensions, if mechanical oscillations such as, for instance, acoustic oscillations act upon the rubber piece such that the oscillations produce tension stresses or compression stresses in the rubber piece. The electric tensions evidently are caused by effects that are similar to the piezoelectric actions of the crystals so that presumably a certain orientation of the rubber molecules takes place during the manufacturing process of the rubber, for instance, at the rolling of the plate from natural rubber.

In accordance with a further feature of the invention, the piezoelectric action is increased by causing the rubber solution to freeze in an electrical field. It is also possible to vulcanize the rubber in an electrical field. The rubber mass is caused to harden between plates to which a voltage is applied.

The accompanying figure illustrates a microphone as example embodying the idea of the invention. The microphone body 1 exposed to acoustic oscillations consists of rubber, the voltage produced being derived by means of the electrodes 2. In order to assure a possibly favorable picking up of this voltage, a thin metal layer 3 is preferably applied to the rubber piece and a thin metal foil is to be placed between the electrodes and the rubber piece.

What is claimed is:

The method of producing an element which when subjected to mechanical stresses will provide electrical tensions and vice versa which includes the steps of, freezing a rubber solution to obtain solid rubber, and subjecting said solution to an electrical field during said freezing process to so orient the rubber molecules as to enhance the ability of said element to provide electrical tension when subjected to mechanical stresses and vice versa.

ERWIN GERLACH.