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K. S. DUNLAP ET AL

2,356,229

ALTERNATING CURRENT GENERATOR

Filed Jan. 29, 1942

FIG. 1

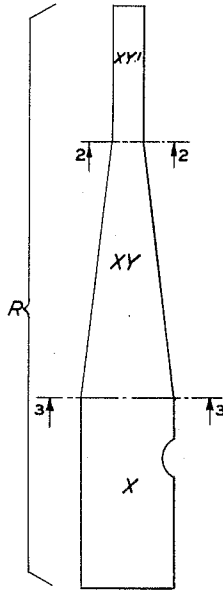


FIG. 2



FIG. 3

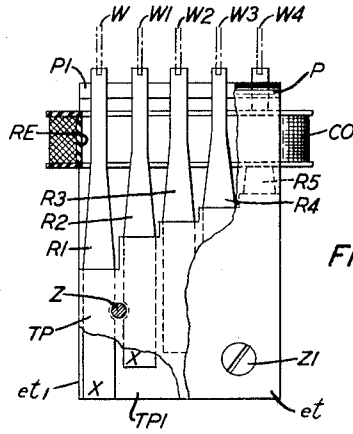
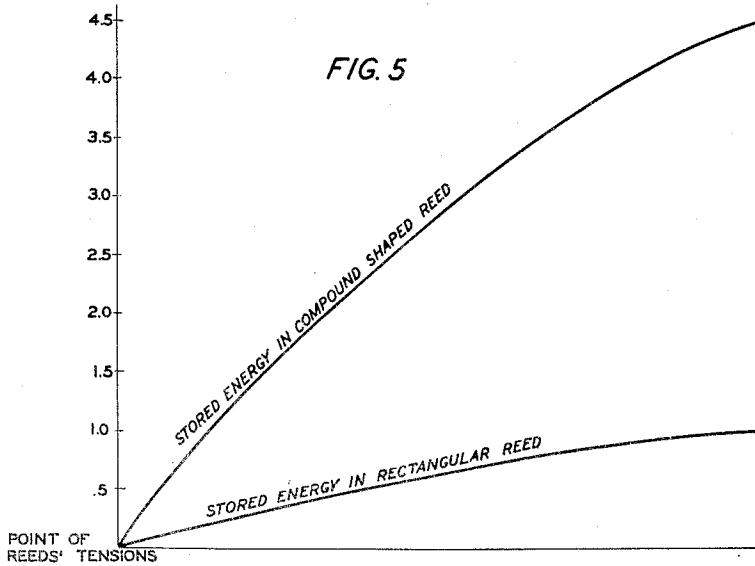


FIG. 4

FIG. 5



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ALTERNATING CURRENT GENERATOR

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2 Claims. (Cl. 179—90)

This invention relates to reed type generators such as are used, for example, in impulse transmitters.

The object of the invention is to provide an improved reed which is capable of storing large amounts of energy per unit mass without incurring strains of sufficient magnitude to injure the reed, and which can be cheaply manufactured.

In alternating current generators of the pick-up type used, for example, in musical instruments, telephone call transmitters and other well-known types of signaling devices, piano wires and small lengths of metallic strips or ribbons are vibrated between the poles of a magnet for generating alternating current in a coil of frequencies corresponding to predetermined adjusted periods of vibration of the wires or strips, the alternating current thus generated being amplified for operating the signaling devices or reproduced through loud-speakers electrically connected to the amplifiers.

The energy capacity of such a reed is an important factor in determining the reliability of the signaling system and it is necessary to obtain from such generators, though of necessity of limited size due to being incorporated in subscribers' impulse transmitters, signal voltages strong enough to override noises encountered in telephone channels if false operation of the receiving apparatus at the telephone central office is to be avoided.

In such alternating current generators, the strength of the signals is directly proportional to the energy stored in the vibrative elements during their tensioning operation, but cylindrical steel rods such as piano wires and flat ribbon-shaped springs heretofore used as vibrative elements have been found to possess an extremely low degree of efficiency in relation to the force applied for operating them.

Applicants have discovered that a much greater amount of energy is stored in a vibrative element constructed with a substantially uniform rigidity from its attaching or securing point to its free end than in reeds of the type heretofore used when flexed under similar pressure and amplitude. According to applicants' discovery, the vibrative element of the invention is formed with a rectangular-shaped securing portion, a tapered portion and a reduced rectangular-shaped portion contiguous to the tapered portion, the tapered portion and the reduced rectangular portion co-extensive thereof forming a flexing portion of substantial uniform rigidity generating alternative current signals of a high order.

In the drawing:

Fig. 1 is a plan view of the improved reed;

Fig. 2 is a cross-sectional view taken on line 2—2 of Fig. 1;

Fig. 3 is a cross-sectional view taken on line 3—3 of Fig. 1;

Fig. 4 is an assembly view of a number of vibrative elements constructed according to the invention, shown in assembled relation with a coil, a magnet and elements of their actuating mechanism; and,

Fig. 5 is curves showing the energy stored in the vibrative element of our invention in comparison with the energy stored in a rectangular reed under similar tension.

In accordance with the invention, a vibrative element for an alternating current generator is formed as shown in Fig. 1 with a rectangularly-shaped securing portion X, a tapered portion XY and a rectangularly-shaped portion XY' contiguous to the tapered portion XY, the securing portion X and the portion XY' being each of rectangular cross section as shown in Figs. 2 and 3, respectively.

Vibrative elements shaped according to our invention, as R₁, R₂, R₃, R₄ and R₅, by the use of properly sized punches and dies, may be readily cut from sheet metal for operation at any desired frequencies without requiring tuning adjustment. These elements are secured in assembled relation to each other by clamping them between two metallic plates as TP and TP₁ which are in turn secured between the elements *et* and *et*₁ of a permanent magnet shown in Fig. 4 by a plurality of screws Z and Z₁ with their free ends extending through the hollow core RE of a coil CO for vibration between the poles P and P₁ of magnet elements *et* and *et*₁ in operative relation to respective actuating elements, as W, W₁, W₂, W₃, W₄ and W₅, as shown in dotted lines and which may be actuated for example by a motor-driven mechanism as in musical instruments or by a mechanism under control of manually operated key members as in signaling devices or by electromagnets energized under control of keys.

Vibrative elements constructed in accordance with our invention as indicated in Fig. 5 have been found in actual use to store an amount of energy which is three and a half times greater than that of ordinary vibrative elements with parallel sides, similar thickness and under equal tension and to produce a correspondingly greater increase in the strength of the signals generated due to the substantial uniform stiffness of the elements from their securing portions to their

free ends as distinguished from vibrative elements having parallel sides which possess greater stiffness at their free ends than at their securing points with the result that only a small amount of energy is stored in the flexing operation of such elements.

What is claimed is:

1. An alternating current generator vibrative reed, said reed having two portions formed with parallel sides and a tapered portion, one of said two portions forming a securing means for the reed and the other of said two portions and the tapered portion forming a flexing portion, the portion cooperating with the tapered portion to form the flexing body portion of the reed being 15

adapted to be engaged by a manually operable mechanism for flexing the reed and releasing it to cause its vibration.

2. An alternating current generator vibrative reed, said reed being made of magnetic material and having a securing portion, a tapered portion and a rectangularly-shaped portion, the tapered portion extending in straight lines from the width of the securing portion to a point connecting with the rectangularly-shaped portion, the length of the rectangularly-shaped portion being less than the length of the tapered portion.

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