

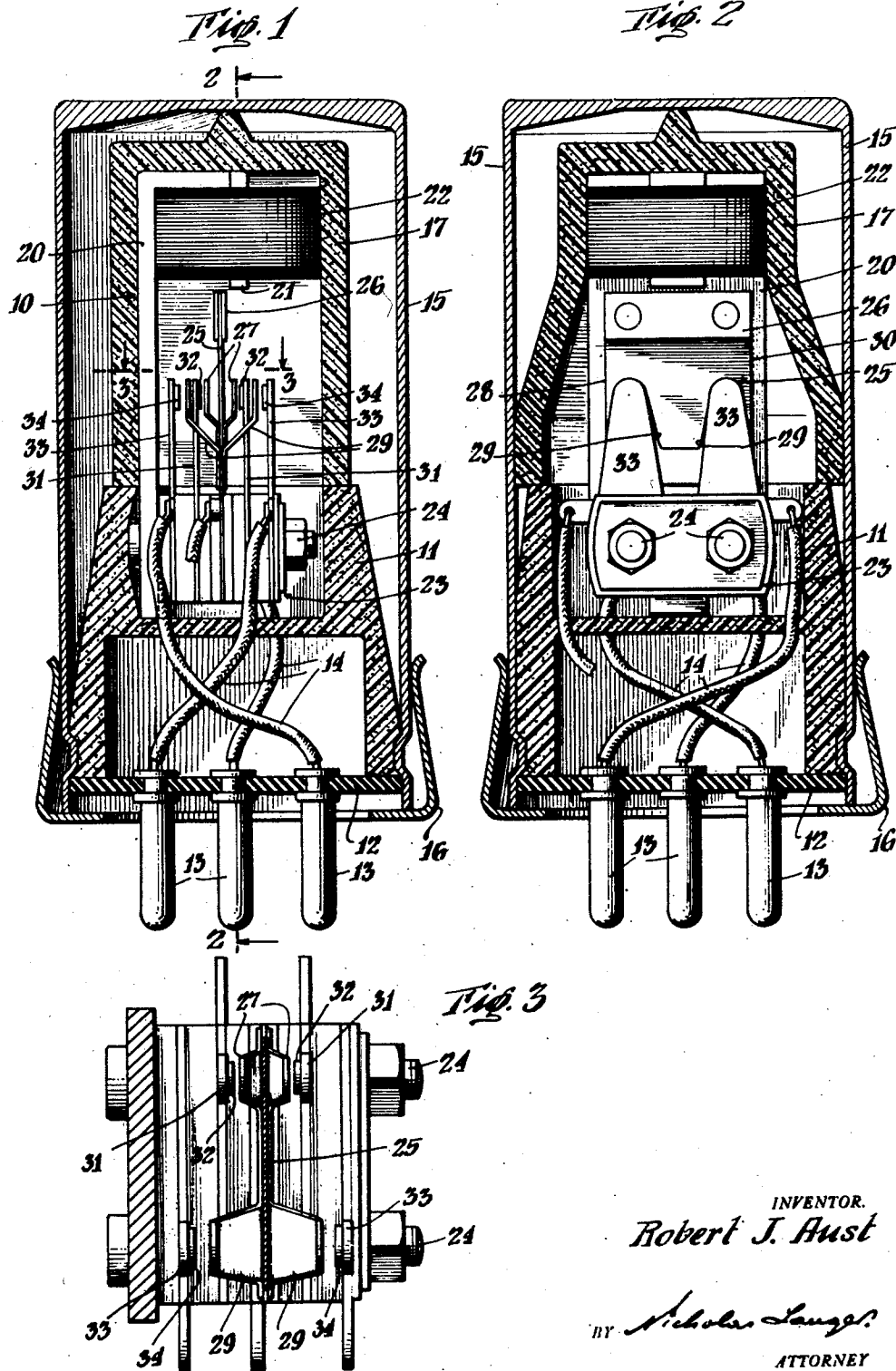
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R. J. AUST

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CONTACT ARRANGEMENT FOR VIBRATORS

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CONTACT ARRANGEMENT FOR VIBRATORS

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1

2

This invention relates to vibratory motors and to a novel contact arrangement therefor.

This invention is particularly applicable to vibrators in which two sets of contacts are provided, one for interrupting the direct current supplied to a transformer primary winding and the other for rectifying the output current of the transformer secondary winding.

In vibrators heretofore utilized the spring or arms which support the two sets of contacts are ordinarily symmetrically disposed at equal distances from the vibratory reed. When vibrators of this type are assembled, difficulties are experienced in properly adjusting the contact springs since the operator cannot see both sets of contacts at the same time and, hence, considerable manipulation of the vibrator assembly is necessary in order to secure proper adjustment. In accordance with this invention, the contact springs or arms of one set of contacts are disposed at a greater distance from the reed than the springs or arms for the other set of contacts with the result that all contact surfaces are readily visible to the operator from the side of the vibrator. Accordingly, an inspector or operator may hold the vibrator in one hand and inspect all the contacts at the same time without the necessity of turning the vibrator. An additional advantage of the novel contact arrangement resides in the fact that greater contact pressure is obtained upon the set of contacts which is mounted closest to the reed. Consequently, this set may be used advantageously to interrupt the low voltage supply to the transformer primary since the current supplied by this circuit is greater than that carried by the high voltage secondary circuit in which the rectifier contacts are utilized.

It is an object of this invention to improve the construction and operation of vibrators and, particularly, of vibrator contact arrangements.

It is a further object of the invention to provide a vibrator in which one set of contacts is mounted closer to the reed than the other set of contacts with the result that all contact surfaces are readily visible to the operator from the sides of the vibrator.

It is a still further object of the invention to provide a vibrator in which greater contact pressure is obtained on the interrupter contacts than on the rectifier contacts.

Other objects of the invention will be apparent from the following description and accompanying drawings taken in connection with the appended claims.

The invention accordingly comprises the features of construction, combination of elements, arrangement of parts, and methods of manufacture referred to above or which will be brought out and exemplified in the disclosure hereinafter set forth, including the illustrations in the drawings, the scope of the invention being indicated in the appended claims.

For a fuller understanding of the nature and objects of the invention as well as for specific fulfillment thereof, reference should be had to the following detailed description taken in connection with the accompanying drawings, in which:

Figure 1 is a vertical sectional view of a vibratory motor utilizing the novel contact construction; and

Figures 2 and 3 are, respectively, sectional views taken along the lines 2—2 and 3—3 of Figure 1.

While a preferred embodiment of the invention is described herein, it is contemplated that considerable variation may be made in the method of procedure and the construction of parts without departing from the spirit of the invention. In the following description and in the claims, parts will be identified by specific names for convenience, but they are intended to be as generic in their application to similar parts as the art will permit.

The vibrator structure described herein is similar, in many respects, to the structure disclosed in the copending applications of R. J. Aust and Clarence Huettner, Serials Nos. 579,232, now Patent No. 2,490,895, December 13, 1949 and 648,030 entitled, respectively, "High Frequency Vibrator" and "Vibrator."

Referring now to the drawings in detail, the novel vibratory motor 10 of the present invention may be supported in a sponge rubber socket 11 which rests upon a base 12 having a plurality of connectors 13 secured thereto in any suitable manner, these connectors being attached to leads 14 which extend, in the usual manner, to the vibrator contacts, reed, and driver coil. A can 15 is fixed to the base 12 as by a clamping ring 16 and a resilient sponge member 17 is mounted within the can, this resilient member together with the socket 11 forming a housing for the vibratory unit 10 which prevents transmission of vibrations to the base.

The novel vibratory motor includes an L-shaped frame 20 to which is secured a pole piece 21 having a driver coil 22 mounted thereon. A stack 23 is secured to the other end of the frame as by screws 24, this stack consisting of several layers

3

of insulating material between which the contact springs and reed are mounted in the manner now to be explained. A vibratory reed 25 which, in the example shown, consists of a plate of spring material is secured between two insulating members at the middle of the stack and this reed carries at the free end thereof an armature or weight 26 which is adapted to be periodically attracted by the driver coil in order to maintain the reed in continuous vibration during operation of the vibratory motor. A set of interrupter reed arms 27 is mounted adjacent one longitudinal edge 28 of the reed and a set of rectifier reed arms 29 is mounted adjacent the other longitudinal edge 30 of the reed. As shown, each set comprises a pair of arms disposed at opposite respective sides of the reed and the free ends of the reed arms constitute contact surfaces for engagement with the side springs in the manner to be hereinafter described. If desired, however, suitable contacts may be brazed or otherwise secured to the free ends of the reed arms for the purpose of engaging the stationary contacts. A set of interrupter side springs 31 is mounted in the stack 23 and the free ends of these springs carry contacts 32 which are adapted to contact the free ends of the respective reed arms 27. In similar fashion, a set of rectifier side springs 33 is mounted in the stack and contacts 34 are disposed at the free ends of these springs for engagement with the free ends of the respective reed arms 29.

According to the invention, the rectifier side springs 33 are disposed at a greater distance from the reed than the interrupter side springs 31 with the result that the contacts are horizontally offset or staggered so that all of the contact surfaces are readily visible to an operator inspecting the vibrator from one side thereof. This is clearly apparent from an inspection of Figure 1 which shows the vibrator as it would appear to an observer or operator standing at one side thereof substantially in the plane of the reed 25. It will be apparent that the spacing between the respective sets of contacts may be readily observed from either side of the vibrator so that it is a simple matter to quickly and accurately adjust the spacing therebetween. It is a further feature of the invention that all the contact surfaces of the vibrator lie in a substantially common horizontal plane which is perpendicular to the axis of the reed 25. With this construction, the rectifier side springs 33 and interrupter side springs 31 may be of equal length so that fewer different types of parts are required in the construction of the vibrator.

It will be observed that interrupter reed arms 27 are closer to the reed than the rectifier reed arms 29 with the result that greater contact pressure is obtained on the interrupter contacts 27, 32 than on the rectifier contacts 29, 34. In conventional circuits for utilizing a vibratory motor, the interrupter contacts are utilized to alternately energize the two sections of a split primary winding while the rectifier contacts are placed in the high voltage secondary circuit. The primary circuit ordinarily carries considerably heavier current than the secondary circuit and, accordingly, it is desirable to provide greater contact pressure on the interrupter contacts 27, 32 which control the primary circuit. This advantage is inherent in the described contact arrangement.

It will be noted that no contacts are provided

4

on the reed arms, which results in less contact chatter or bounce, when the vibrator is used at high frequencies of operation. The reed arms may be conveniently plated with a suitable conducting material and the vibrators may be connected in circuit so that transference of metal due to the passage of current therethrough is from the contacts mounted on the side springs to the free ends of the reed springs. It will be apparent, however, that this invention is also applicable to vibrators wherein both the reed arms and side springs carry contacts or to vibrators where the side springs engage the reed directly without the intervention of auxiliary contacts.

While the present invention, as to its objects and advantages, has been described herein as carried out in specific embodiments thereof, it is not desired to be limited thereby but it is intended to cover the invention broadly within the spirit and scope of the appended claims.

What is claimed as new and desired to be secured by Letters Patent is:

1. A circuit interrupter comprising a vibratory reed secured to said stack; a set of contact reed arms mounted adjacent one longitudinal edge of said reed and adaptable for current interrupting; another set of contact reed arms mounted adjacent the other longitudinal edge of said reed and adaptable for current rectifying use, each set including a pair of reed arms disposed, respectively, at opposite sides of said reed; a side spring mounted opposite to each reed arm; and a contact on each side spring which is adapted to periodically contact the associated reed arm during operation of the vibrator, the interrupter contacts being spaced closer to the reed than the rectifier contacts whereby a greater contact pressure is exerted upon the interrupter contacts during vibration of the reed and all of said contacts are readily visible from the sides of the vibrator which are at substantially right angles to said opposite sides of said reed.

2. A contact arrangement for a vibrator including a stack, comprising a reed secured to said stack, two sets of reed arms mounted on said reed, one of said sets having contacts disposed from said reed, at a greater distance than the contacts in the other set, and two sets of side springs supported by said stack, each set comprising a pair of springs disposed, respectively, at opposite sides of the reed, all of said side springs being of equal length and having contact surfaces at the free end thereof which are adapted, respectively, for engagement with the contacts of said reed arms.

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