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2,307,537

TELEPHONE CALL TRANSMITTER

Filed May 14, 1941

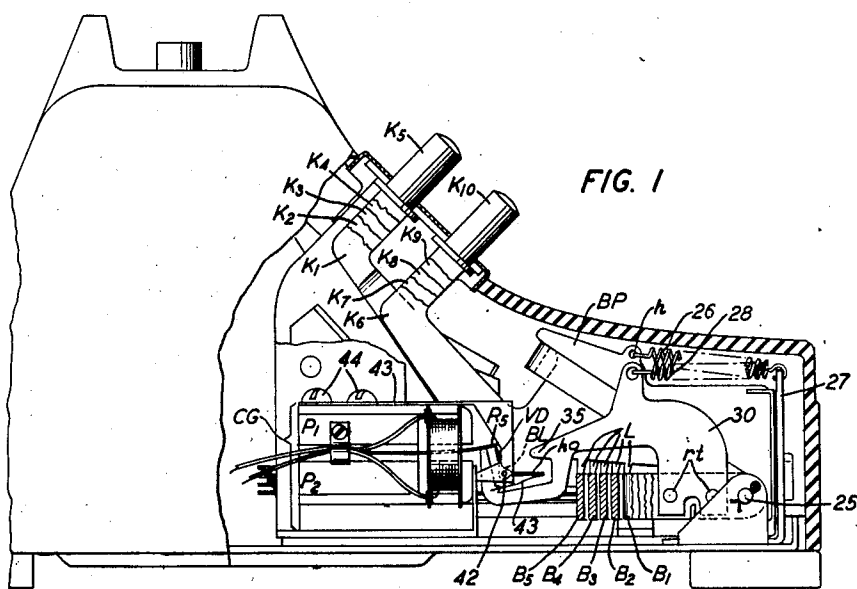


FIG. 1

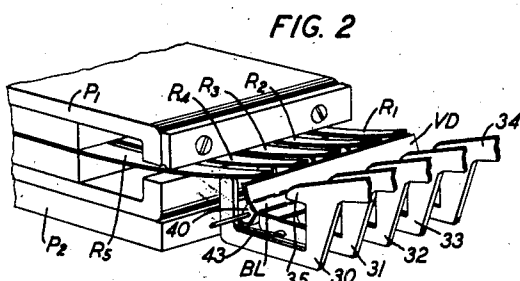


FIG. 2

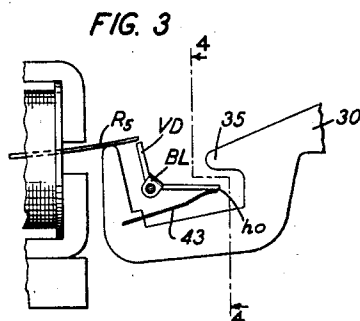


FIG. 3

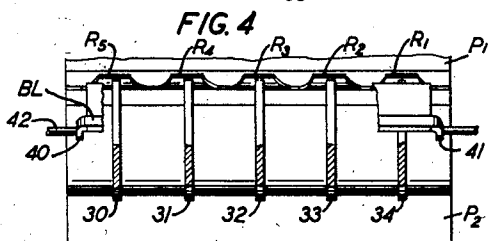


FIG. 4

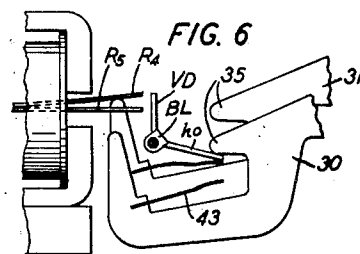


FIG. 6

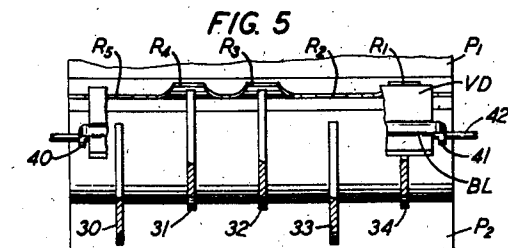


FIG. 5

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TELEPHONE CALL TRANSMITTER

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Application May 14, 1941, Serial No. 393,329

5 Claims. (Cl. 179-90)

This invention relates to telephone call transmitters.

It is an improvement over the telephone call transmitter disclosed in a copending application filed in the name of R. F. Mallina, March 22, 1940, Serial No. 325,347.

In the transmitter disclosed in that application a set of key members is used for actuating U-shaped bars in predetermined combinations for releasing normally pretensioned vibrative elements in similar combinations by the operation of individual latch members or pawls normally holding the vibrative elements in their pretensioned position, the operation of the vibrative elements in the magnetic field of a generator being effective to transmit signals corresponding to the numerical value of the successively operated keys.

In the operation of this transmitter the applicant discovered that lag in the release of any one of the vibrative elements in any of the combinations caused non-uniformity in the strength of the signal transmitted by the generator and that it was found impractical to machine the parts used for the operating mechanism of this transmitter with sufficient accuracy so as to insure the release of the vibrative elements in a predetermined combination simultaneously in order to obtain uniformity in the strength of the signals thus generated.

The object of the invention is the provision of a simple and efficient key-operated mechanism whereby the vibrative elements of the reed generator are released simultaneously from pretensioned position by a common member in any of the combinations representing the digits of the keys so as to obtain uniformity in the strength of the current signals generated by the simultaneous operation of these elements.

In the drawing:

Fig. 1 is a side elevation of the telephone call transmitter embodying the invention, the casing being shown with portions broken away;

Fig. 2 is a partial view of the transmitter mechanism shown in perspective;

Fig. 3 is a side view of Fig. 2 showing the vibrative elements in the pretensioned position;

Fig. 4 is a front view with the vibrative elements shown in their pretensioned position and their actuating members in vertical section taken on line 4-4 of Fig. 3, the common latch member for the vibrative elements being shown with portions broken away;

Fig. 5 is a front view similar to Fig. 4 showing two of the vibrative elements in position fol-

lowing their release by the latch mechanism of the invention; and

Fig. 6 is a side view of Fig. 5.

The call transmitter to which the invention is particularly well adapted for use consists of a set of ten key members K1, K2, K3, K4, K5, K6, K7, K8, K9, and K10 numbered to represent digits 1 to 9 plus a zero. The key members are pivoted as shown in Fig. 1, on a shaft 25 also serving for pivotally supporting five U-shaped bars B1, B2, B3, B4 and B5, extending transversely of the keys for operation in predetermined combinations, the key members being yieldably held in normal non-operated position as by similar retractile springs 26 having one of their ends hooked to the top disposed edge of a plate 27 and their other ends hooked as at a point *h* of the body portions BP of the keys, while the U-shaped bars B1, B2, B3, B4 and B5 are yieldably held in engaged relation with downwardly extending lugs L formed with the keys K1, K2, K3, etc., by similar retractile springs 28 having one of their ends hooked to the plate 27 and their other ends to respective arms 30, 31, 32, 33 and 34 secured to one of the pivoted arms of the U-shaped bars B1, B2, B3, B4 and B5 as by rivets *rt* shown in Fig. 1. The retractile springs 28 are adjusted to sufficient normal tension so as to cause the free ends of the arms 30, 31, 32, 33 and 34 to engage with the under-side of vibrative elements R1, R2, R3, R4 and R5, respectively, so as to flex these elements in the position shown in Figs. 1, 2, 3 and 4, and by elements R3 and R4 in Figs. 5 and 6.

A latching member in the form of a bar B1 of angular cross section is provided with bearing portions 40 and 41 for pivotally engaging a shaft 42 in turn supported by a bracket 45, mounted on the pole-piece P1 of an alternating current generator CG as by screws 44 passing through clearance holes in the bracket 45 and in pole-piece P1 in threaded engagement with similarly screw-threaded holes in the pole-piece P2 of the generator, these pole-pieces also serving for clamping the vibrative elements R1, R2, R3, R4 and R5 therebetween under the tightening effect of screws 44.

The latching or stopping member BL has its side *vd* extending upwardly for engaging with the under-side of vibrative elements R1, R2, R3, etc., for holding these elements collectively in the pretensioned position immediately following a small movement imparted to one of the keys K1, K2, K3, etc., as the case may be for actuating a number of bars B1, B2, B3, B4 and B5 in

their preassigned combinations. The continued movement of the key which may be actuated and that of bars B1, B2, B3, etc. in the combination of that key is effective to impart a small pivotal movement to the latching bar BL upon the engagement of lug portions as 35 formed with the arms 30, 31, 32, 33 and 34 of bars B1, B2, B3, etc. actuated in that combination with the horizontally disposed side *ho* of latching bar BL to release a number of vibrative elements R1, R2, R3, R4 and R5 in the combination of that key simultaneously, while the other vibrative elements are held in their pretensioned position by the retractile springs 28 of U-shaped bars B1, B2, B3, etc., which have not been actuated by the depressed key.

Upon the release of the operated key by the operator this key is returned to normal position by its retracting spring 26, while the bars B1, B2, B3, etc. which have been actuated by that key are returned to normal position by the tension of their retractile spring 28. The return movement of bars B1, B2, B3, B4 and B5 which have been operated cause the reengagement of their arms 30, 31, 32, 33 and 34 as the case may be with their respectively associated vibrative elements R1, R2, R3, R4, and R5 for pretensioning them, while the latching bar BL is rotated by the tension of springs 43 carried by arms 30, 31, 32, 33 and 34 for placing the side *vd* of this bar in stopping position relative to the vibrative elements R1, R2, R3, R4 and R5.

In a typical example of operation, supposing that it is desired to transmit a signal by the operation of one of the digit keys K1, K2, K3, etc., shown in Fig. 1, the operation of any one of these keys is effective to impart a corresponding movement to a number of bars B1, B2, B3, B4 and B5 as the case may be and therefore to a similar number of arms 30, 31, 32, 33 and 34 carried thereby, for example the arms 30 and 33 carried by bars B5 and B2. The operation of arms 30 and 33, a small angular movement from the position shown in Figs. 2, 3 and 4, is effective to permit the vibrative elements R5 and R2 to move under the medium of their own resiliency in position to rest on the edge of the upwardly extending side *vd* of latching bar BL. The continued movement of arms 30 and 33 causes the projections 35 of these arms to engage the side *ho* of the latch bar BL for imparting a pivotal movement to this bar from the position shown in Fig. 3 to the position shown in Fig. 6 thus causing the simultaneous release and operation of the vibrative elements R5 and R2 associated with the operated arms 30 and 33 and thereby avoiding the lag present in the R. F. Mallina application above referred to.

In the operation of the mechanism of the invention, supposing that due to inaccuracies in the machining of the operating parts, such as the key members K1, K2, K3, etc., the U-shaped bars B1, B2, B3, etc., and the arms 30, 31, 32, 33 and 34, carried by these bars, the arm 30 for example engages the side *ho* of latch bar BL prior to the engagement of the latch bar by arm 33. Under this condition the vibrative element R2 associated with arm 33 will nevertheless be released simultaneously with the vibrative element R5 associated with arm 30 upon the pivotal operation of latch bar BL as effected by arm 30, thus obtaining uniform current strength in the signals thus transmitted which is necessary for the proper operation of the switches controlled by the signals generated by the collective operations of the vi-

brative elements in their pre-assigned combinations.

What is claimed is:

1. A mechanism for the operation of vibrative elements, said mechanism comprising a set of manually operable keys, actuating members for said elements operable in predetermined combinations by the operation of said keys, said members normally holding said elements in the pretensioned position, spring means carried by each of said members, means common to all of said vibrative elements movable in the vibrating path of said elements by the tension of said spring means, said common means operable upon the movement of a number of said actuating members by each of said key members for releasing their respectively associated vibrative elements in said combinations simultaneously.

2. A mechanism for the operation of vibrative elements, said mechanism having a plurality of means for moving the elements in pretensioned position and a plurality of manually operable means for actuating the first-mentioned means in predetermined combinations, the improvement which consists in the provision of a common member normally positioned for holding all the vibrative elements in the pretensioned position following a small movement of one of the manually operable means said common bar operating upon the continued operation of a number of the first-mentioned means by one of the second-mentioned means for disengaging the elements in that combination simultaneously.

3. A call transmitter having a set of key members, a plurality of bars actuated in predetermined combinations by the operation of the key members, a plurality of vibrative elements and a plurality of means carried by the bars for normally tensioning the elements, the improvement which consists in the provision of means common to all the elements and operable by the operation of each of the first-mentioned means for releasing the elements in any one of the combinations simultaneously.

4. A call transmitter having a set of key members, a set of vibrative elements, a plurality of operating arms normally holding the elements in pretensioned position in combination with a pivoted member common to the elements for holding the latter in the pretensioned position following a predetermined operation of a number of arms by any one of the key members, the pivoted member operating upon the continued movement of the last-mentioned key member for releasing the vibrative elements corresponding to the operation of the arms simultaneously.

5. In a call transmitter, a set of vibrative elements, a set of manually operable key members, a plurality of means operated in predetermined combinations by the movement of said key members, said means normally engaging said elements for moving them in a pretensioned position, a latching member for holding said elements collectively in said pretensioned position following a small movement of a number of said means in said combinations preparatory to the release of a corresponding number of said elements by the first-mentioned means following the operation of one of said keys, said latching member operating for releasing said elements simultaneously in that combination upon the continued operation of said means by the last-mentioned key.

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