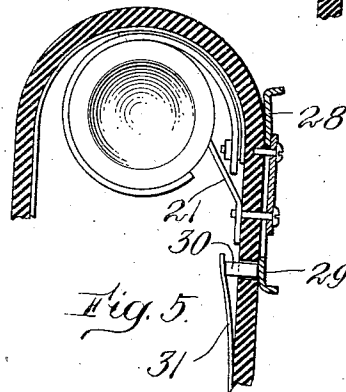
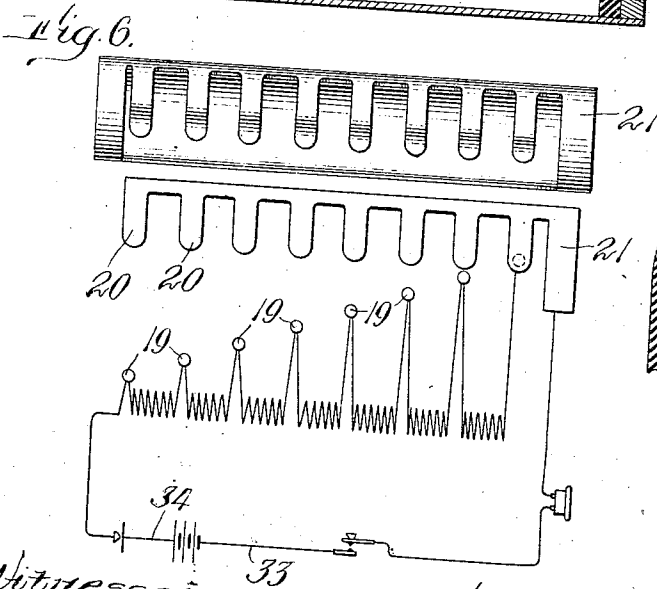
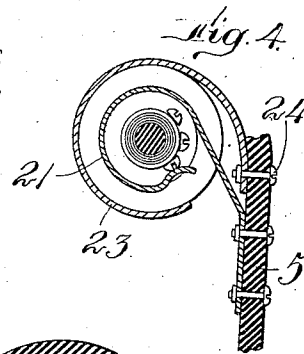
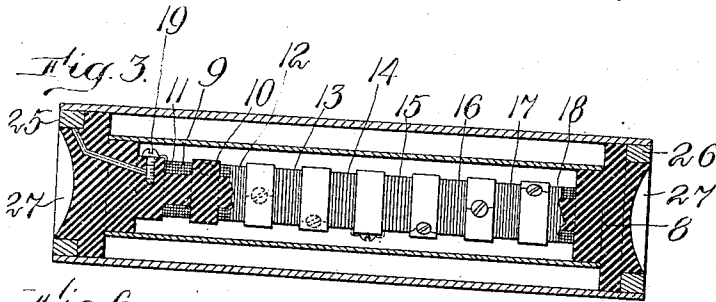
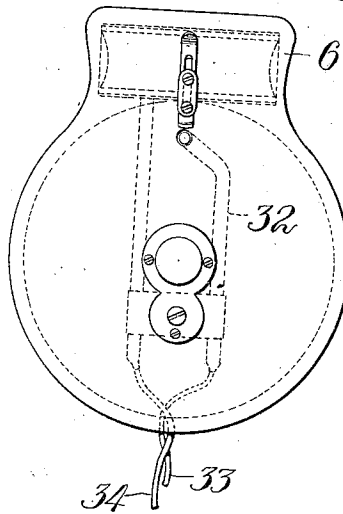
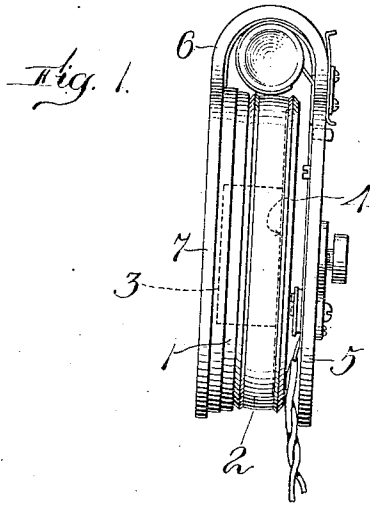


C. E. WILLIAMS.
 PORTABLE AUDIPHONE TRANSMITTER.
 APPLICATION FILED JAN. 6, 1908.

945,430.

Patented Jan. 4, 1910.



Witnesses:
 William J. Pike
 Edward Maxwell.

Fig. 7

Inventor:
 Charles E. Williams,
 by Geo. H. Maxwell,
 Attorney.

UNITED STATES PATENT OFFICE.

CHARLES E. WILLIAMS, OF BOSTON, MASSACHUSETTS.

PORTABLE AUDIPHONE-TRANSMITTER.

945,430.

Specification of Letters Patent.

Patented Jan. 4, 1910.

Application filed January 6, 1908. Serial No. 409,431.

To all whom it may concern:

Be it known that I, CHARLES E. WILLIAMS, a citizen of the United States, and resident of Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Portable Audiphone-Transmitters, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

In that class of audiphone transmitters which are portable and intended to be hung on the garment of the user, and which it is desirable should be as inconspicuous as possible, there is special need that the construction shall be light, efficient, compact, simple, and inexpensive. As, however, these instruments are intended to be carried by the user wherever he or she goes, and should therefore be always in proper operative condition, they have either heretofore usually been unduly heavy or else irregular and inefficient, and lacking in the other requisites mentioned. For instance, it is essential that the current should be steady all the time and adapted or adaptable to the special requirements of the person using the instrument, whereas in practice no way has been provided for adjusting these instruments to the cheap small battery with which, as a practical commercial matter, they must be used, and hence the usual practice has been to make up the transmitter for a medium current, with the result that when the battery is new the current is too strong, and hence gives a husky sputtering sound, losing the proper articulation. Again, on a dry day the current is stronger than on a humid day. These and other conditions commonly experienced by the users of such instruments have largely restricted the use of this very desirable class of instruments. The person also is an important factor, as one day a deaf person will often hear better than on another day. Also, it is a common experience for a deaf person, after he gets accustomed to his instrument, not to need so strong a current as he did at the beginning. For these and other reasons I have provided this kind of an audiphone transmitter with means for cutting down the current, and to this end I

have arranged in connection with the transmitter case and its diaphragm and electrode, a rheostat mounted in said case in series with the carbon electrode, said rheostat, although externally operable, being entirely inclosed and practically protected from inspection, interference and injury, being mounted in the partially cylindrical neck portion of the case.

In the drawings, in which I have shown a preferred embodiment of the invention, Figure 1 shows in side elevation a portable audiphone transmitter containing my invention; Fig. 2 is a view thereof in rear elevation; Figs. 3, 4, and 5 are fragmentary details in longitudinal section, central vertical section, and enlarged vertical section respectively, showing the rheostat and its connections; and Figs. 6 and 7 are plan views, the latter being largely diagrammatic, showing further details of the rheostat.

Transmitters of the audiphone type are exceedingly sensitive, and are planned to work to the best advantage with a given voltage of a predetermined current, the batteries are of necessity small as they must be carried on the person, but on account of the size, the batteries, as at present manufactured, do not produce a current even enough to operate the audiphone to the best advantage. For instance, when a fresh battery is connected with the instrument, the current is too strong, with the result that the transmitter gives a harsh sputtering sound, whereas when the battery has been used for some time the current is not sufficient to operate the transmitter properly. The conditions of use, however, render it impracticable for the user to carry around any ordinary current regulator, and of course no such regulator can be applied to the instrument itself without destroying, from a practical standpoint, its portable character. Accordingly, I have so modified and constructed the transmitter as to combine with it additional movable parts to constitute therewith, to all intents and purposes, a rheostat or current regulator for the current which is delivered to the usual electrode.

In the drawings I have shown a portable

transmitter 1 which may have the usual general internal construction of such instruments, and need not therefore be specifically shown and described, including a case 2, a
 5 usual carbon electrode 3, diaphragm 4 and back 5. The latter is connected by a relatively narrow neck 6 with the front 7 of the instrument, said neck having sufficient width, as shown in Fig. 2, and being
 10 approximately semi-cylindrical, as shown in Figs. 1 and 5, to receive a spool 8 of insulating material having successive reduced portions 9 and intervening enlarged portions or hubs 10, which construction
 15 may be said to constitute a series of spools each wound with its complement of wire, as indicated at 11-18, the wire from one spool to the next being passed over the intervening hub and secured preferably
 20 by solder to set screws 19, set preferably spirally or out of step with each other to co-operate successively with the contact tongues or fingers 20 of a fixed spring contact drum or holder 21 secured rigidly to the back 5
 25 as indicated, Fig. 4, and the holder is supported by a conductor case 23 secured rigidly to the back at 24. At its opposite ends the latter is provided with rings 25, 26, preferably of conductive material, one of
 30 which, as 25, is in contact with one terminal of the resistance winding. The non-conducting or insulating material 8 of which the spool is composed is hollowed out at its ends at 27 to be engaged by the thumb and
 35 finger of the operator, thereby permitting it to be readily turned without disturbing the transmitter in any way. Close to the top of the instrument, just at the rear side of the neck 6, I provide a small thin sliding
 40 contact plate 28 whose forward end 29 is adapted to slide into positive contact-closing engagement with a contact stud 30 held yieldingly forward by a spring 31 which connects by a wire 32 on the inner side of
 45 said back with one of the wires from the battery, as indicated at 33, and thence to the contact spring 21, Figs. 5 and 7. From the opposite side of the battery a wire 34 leads to the diaphragm, etc., in usual manner.
 50 From the above description it will be seen that my construction carries with it all the advantages of a regular rheostat, but without enlarging the instrument, or appreciably adding to its weight, and without
 55 introducing any complicated mechanism, or in fact anything that need be understood by the user. Nothing of the electrical construction is visible, but merely the two fiberoid ends 27, which the operator engages be-
 60 tween his thumb and forefinger in order slightly to rotate the spool and its winding one way or the other so as to bring into effective circuit more or less of the resistance, according to the requirements of the

weather, battery, or condition of the user. 65
 By varying the current delivered to the diaphragm and its cooperating electrode the utmost delicacy of adjustment and the volume of sound is made readily practicable. The current-varying means is under perfect control 70 of the user at all times.

Having described my invention, what I claim as new, and desire to secure by Letters Patent is:

1. The combination with an audiphone 75 transmitter, comprising a case, a diaphragm, and cooperating electrode and electric circuit, of a series of resistances mounted to rotate within the case, and contacts cooperating therewith to cut said resistances successively into series with said circuit. 80

2. The combination with an audiphone transmitter, having its case provided with a narrow neck-portion curved over on itself, and a rheostat mounted with the hollow of 85 said neck-portion.

3. The combination with an audiphone transmitter, having its case provided with a narrow neck-portion curved over on itself, and a rheostat mounted to rotate within the 90 hollow of said neck-portion.

4. The combination with an audiphone transmitter, having its case provided with a narrow neck-portion curved over on itself, and a rheostat mounted to rotate within the 95 hollow of said neck-portion, the rheostat being in the form of a cylinder having its ends in position at the opposite edges of the neck-portion to be engaged for turning the rheostat. 100

5. The combination with an audiphone transmitter, having its case provided with a narrow neck-portion curved over on itself, a rheostat mounted within the hollow of said neck-portion, and a switch mounted adjacent 105 the rheostat on said neck-portion.

6. The combination with an audiphone transmitter, comprising a case, a diaphragm and cooperating electrode and its electric circuit, of a rheostat mounted within said case 110 and including a spool provided with a series of resistances supported by intervening contact devices, and a cylindrical drum or holder provided with a series of connected contact fingers in position to engage said 115 contacts one at a time, said cylindrical drum and said spool being arranged for relative rotation within said case.

7. The combination with an audiphone transmitter, comprising a case, a diaphragm 120 and cooperating electrode and its electric circuit, of a rheostat mounted in the case in the plane of the transmitter approximately tangentially of said diaphragm and including a rotary spool having its ends closed and terminating at the opposite edges of the case in position to be engaged respectively by the 125 thumb and finger for turning, said spool

having a series of resistances wound thereon
throughout its length supported by inter-
vening hubs containing contact devices, and
a fixed contact holder provided with a series
of contact fingers positioned to engage said
5 devices successively.

In testimony whereof, I have signed my

name to this specification, in the presence of
two subscribing witnesses.

CHARLES E. WILLIAMS.

Witnesses:

M. J. SPALDING,
EDWARD MAXWELL.