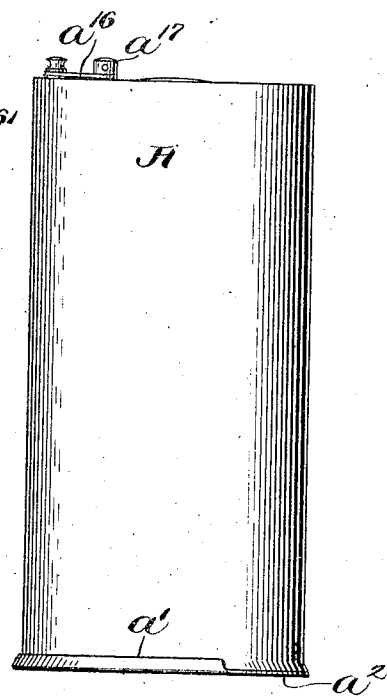
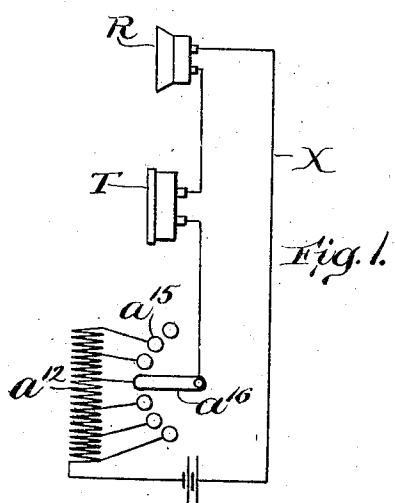
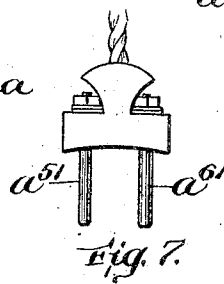
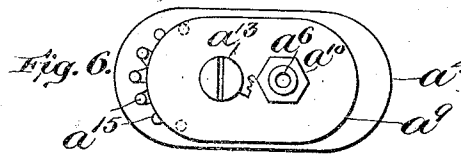
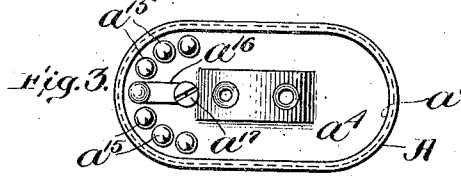
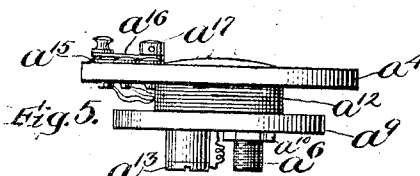
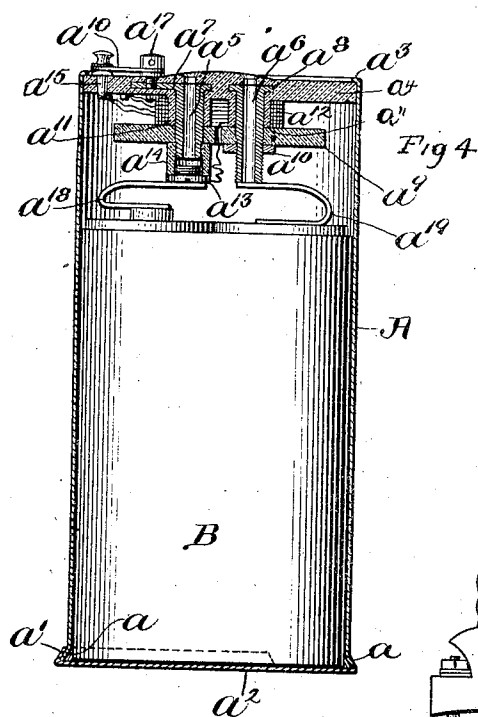


No. 825,882.

PATENTED JULY 10, 1906.

C. W. HARPER.
BATTERY.

APPLICATION FILED APR. 8, 1904. RENEWED JUNE 12, 1906.



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UNITED STATES PATENT OFFICE.

CHARLES W. HARPER, OF MALDEN, MASSACHUSETTS.

BATTERY.

No. 825,882.

Specification of Letters Patent.

Patented July 10, 1906.

Application filed April 8, 1904. Renewed June 12, 1906. Serial No. 321,387.

To all whom it may concern:

Be it known that I, CHARLES W. HARPER, citizen of the United States, and a resident of Malden, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Batteries, of which the following is a specification.

My invention is a portable telephone system particularly adapted to be carried and used by deaf persons.

Systems of the class referred to comprise a single battery-circuit, in which are arranged a transmitter, a receiver, and a battery.

In an application filed by me September 12, 1902, Serial No. 123,060, I have shown and described a transmitter particularly adapted for use in a portable telephone system for deaf persons in which the transmitter is so constructed that its action can be regulated to accord with the necessities of the individual by whom it is to be used. As is obvious, different degrees of deafness and differences of organic disease may require different degrees of loudness suited to the needs of the particular individual who uses the system. The transmitter referred to is arranged to be so adjusted as to cause the receiver of the system to operate with a degree of loudness suited to the needs of the particular individual, and, as pointed out in said application, an increase in the loudness or volume of sound at the receiver is not accomplished without detracting slightly from distinctness of articulation. The adjustment of the said transmitter was designed to give variations in the action of the transmitter, so that the most effective action for the needs of the user might be achieved—that is to say, such an adjustment is given as gave the desired volume of sound with the maximum clearness of articulation attainable.

It will be obvious that in considering the volume of sound produced in a telephone system two factors enter in—first, the instrumentalities (transmitter, &c.) by means of which the variation in the current is produced, and, second, the strength of that current.

My prior application provided for adjustment of the first factor, and so long as the second factor remained constant the adjustment was right. In practice, however, it was found that the current from the battery was of a constantly-decreasing strength, necessitating more or less frequent changes of adjustment in the transmitter to compensate

for this change in current strength. In my present application I have arranged adjusting means by which the current strength may be kept practically constant by the most simple adjusting means, so that the delicate and careful adjustment which is required in handling the transmitter is dispensed with and ordinary persons can keep the system in its most fully efficient condition. To accomplish this end, I employ a rheostat or other equivalent variable-resistance device in the telephone-circuit, by which the resistance in the line may be varied according to the strength of the battery used and to the particular adjustment of the transmitter and receiver, and at the outset when the battery is at full strength I make the necessary adjustment of the transmitter to give the desired results to the user of the system with a considerable portion of the resistance of the rheostat thrown into the circuit, so that as the battery decreases in strength resistance may be withdrawn and the effect of current strength will remain practically constant, requiring, therefore, no change in adjustment at the transmitter.

A further object of my invention is to provide a compact and convenient pocket-battery of improved construction, the novel features of which are hereinafter pointed out, together with other features of my invention.

In the accompanying drawings, Figure 1 is a diagrammatic view of my improved telephone system. Fig. 2 is an elevation of the pocket-battery hereinafter described. Fig. 3 is a plan view of the pocket-battery shown in Fig. 2. Fig. 4 is a central longitudinal section of the pocket-battery shown in Fig. 2. Fig. 5 is an elevation of one end wall of the box hereinafter referred to. Fig. 6 is a bottom plan view of the end wall shown in Fig. 5. Fig. 7 is a detail hereinafter described.

Having reference to the drawings, A represents a box which is flanged or flared at one end, as at a , to engage an intumed rim a' , provided on a removable cover a^2 . Cover a^2 can be slid on or off the flanged or flared end of the box A to permit battery-cells B to be placed within said box or removed therefrom. At its upper end box A is made with an intumed flange a^3 , against which is seated an end wall a^4 , of hard rubber or the like, held in place mainly by the frictional engagement of its periphery with the interior of the box A, into which it is forced from the opposite end. In the end wall a^4 are embedded the

ends of two sleeves a^5 and a^6 , made, respectively, with heads or flanges a^7 and a^8 . On these two sleeves a^5 and a^6 is mounted a plate a^9 , also of hard rubber or the like, said plate a^9 being fastened in place by a nut a^{10} , screwed onto the threaded end of the sleeve a^6 . The wall a^4 and plate a^9 are held separated by two bosses a^{11} , which constitute the shank or body of a spool, of which wall a^4 forms one flange thereof and plate a^9 the other flange thereof. On the bosses a^{11} is a winding a^{12} , one end of which is connected with a contact a^{13} , herein shown as a screw mounted in a boss a^{14} provided on plate a^9 . At intervals throughout its length the winding a^{12} is connected with a series of fixed contacts a^{15} , mounted in wall a^4 and arranged in the path of an arm a^{16} . The arm a^{16} is pivotally mounted upon a screw a^{17} , fastened to the flange a^7 of sleeve a^5 .

One electrode of battery B has fastened to it a spring-contact a^{18} , which presses against contact a^{13} , and the other electrode of battery B has fastened to it a similar spring-contact a^{19} , which presses against the end of sleeve a^6 .

The sleeves a^5 and a^6 constitute sockets for plugs a^{51} and a^{61} , which are the terminals of the telephone-line. The core of the magnet forming part of the receiver R is, as usual, polarized, and in order to insure the terminal plugs a^{51} and a^{61} being placed in their proper sleeves the internal diameter of sleeve a^5 is made less than the internal diameter of sleeve a^6 . Terminal plug a^{51} is made of a diameter to fit sleeve a^5 , while the other terminal plug a^{61} is of larger diameter to fit sleeve a^6 . By this construction it is made impossible to connect the terminals of the line improperly with the sleeves a^5 and a^6 , in which case the current passing through the windings of receiver R would be opposed to the polarity of the core of the magnet of receiver R.

In telephone systems of this class the transmitter T and receiver R are adjusted to suit the particular degree of deafness of the person who is to use the system, and for best results the battery-current on the line X should be proportioned to the particular adjustment of the transmitter and receiver. Otherwise the operation of the instrument will be defective—that is, if the current is either too great or too little for a particular adjustment of the transmitter and receiver then the operations of those instruments will be defective and the sounds produced at the receiver will be indistinct and feeble or else interspersed with objectionable crackling or boiling sounds. By properly positioning the arm a^{16} , however, the current on the line can be regulated to accord with the adjustment of the transmitter and receiver, and as the battery decreases in strength through use the current can be maintained substantially uniform for

a greater length of time than has heretofore been possible. Heretofore, so far as I am aware, no means such as the rheostat which I employ has been provided in telephone systems by which the current on the line could not only be regulated at will to suit the particular adjustment of the transmitter and receiver, which necessarily varies greatly with different individuals, but also by which the current can be regulated at will to compensate for weakening of the battery through use.

When battery B is exhausted, cover a^2 slid off from the end of box A and the battery removed for the purpose of substituting a fresh one. While battery B is in place within box A, it is pressed by the spring-contacts a^{18} and a^{19} against the cover a^2 and serves to hold the latter in place. Also these spring-contacts a^{18} and a^{19} serve to hold the battery from moving about.

The pocket-battery above described is exceedingly compact and convenient, as well as particularly adapted for a telephone system of this character. All of the parts except the arm a^{16} are inclosed and shielded by the box A, and the end wall a^4 in the form of a spool not only carries the windings of the rheostat, but the sleeves and all of the contacts, and these parts can be assembled on said wall a^4 before the latter is placed in position. Moreover, this end wall can be removed at any time for the purpose of repair or adjustment of the parts carried by it.

It will now be clear that in my improved pocket-battery two contacts, herein shown as consisting of the screw a^{13} and the inner end of sleeve a^6 , are provided upon the interior of the box within which the battery B is placed, and these two contacts are connected with the two electrodes of the battery; also, that end a^4 of the box is in the form of a spool upon which the winding a^{12} is mounted, also upon the interior of the box, it therefore being protected, so that it cannot accidentally be disconnected from the fixed contacts a^{15} or the contact a^{13} .

What I claim is—

1. As a new article of manufacture a box for pocket-batteries having a pair of contacts upon the interior thereof to connect with the electrodes of a battery, one of said contacts being connected with a sleeve adapted to receive one terminal plug of a circuit; a number of resistance-coils mounted on said box and connected with the other of said contacts; a number of fixed contacts also mounted on said box, each connected with one of said coils; a movable contact coöperatively arranged with relation to the fixed contacts, and a sleeve connected with said movable contact adapted to receive the other terminal plug of said circuit.

2. As a new article of manufacture a box for pocket-batteries comprising a pair of con-

tacts upon the interior thereof to connect with the electrodes of a battery, one of said contacts being connected with a sleeve adapted to receive a terminal plug of one size; a number of resistance-coils mounted on said box and connected with the other of said contacts; a number of fixed contacts also mounted on said box, each connected with one of said coils; a movable contact coöperatively arranged with relation to the fixed contacts, and a sleeve connected with said movable contact adapted to receive a terminal plug of another size.

3. As a new article of manufacture a box for pocket-batteries comprising an end wall of insulating material, a pair of contacts upon the inner side of said wall to connect with the electrodes of a battery, one of said contacts being a sleeve embedded in said wall and adapted to receive one of the terminal plugs of a circuit; a number of resistance-coils mounted upon the inner side of said wall and connected with the other of said contacts; a number of fixed contacts upon the outer side of said wall, each connected with one of said coils, a movable contact upon the outer side of said wall and coöperatively arranged with relation to the fixed contact, and a sleeve embedded in said wall and connected with said movable contact adapted to receive the other terminal of said circuit.

4. As a new article of manufacture a box for pocket-batteries comprising a tubular body portion; adapted to receive a battery within it; a removable cover for closing one end of said body; a fixed wall of insulating material closing the other end of the body; a pair of contacts upon the inner side of the fixed wall adapted to connect with the electrodes of the battery, one of said contacts being a sleeve embedded in said wall and adapted to receive one of the terminal plugs of a

circuit; a number of resistance-coils mounted upon the inner side of the fixed wall and connected with the other of said contacts; a number of fixed contacts upon the outer side of the fixed wall, each connected with one of said coils, a movable contact upon the outer side of the fixed wall coöperatively arranged with relation to the fixed contacts, and a sleeve embedded in the fixed wall and connected with said movable contact adapted to receive the other terminal plug of said circuit.

5. As a new article of manufacture a pocket-battery made up of a box comprising a tubular body portion; a removable cover for closing one end of said body; a fixed wall of insulating material, closing the other end of said body; a pair of contacts upon the inner side of the fixed wall, one of said contacts being a sleeve embedded in said wall and adapted to receive one of the terminal plugs of a circuit; a number of resistance-coils mounted upon the inner side of the fixed wall and connected with the other of said contacts; a number of fixed contacts upon the outer side of the fixed wall, each connected with one of said coils; a movable contact upon the outer side of the fixed wall coöperatively arranged with relation to the fixed contacts; a sleeve embedded in the fixed wall and connected with said movable contact adapted to receive the other terminal plug of said circuit, and a battery within said box having its electrodes terminating in spring-contacts to engage the pair of contacts upon the inner side of the fixed wall.

Signed by me at Boston, Massachusetts, this 4th day of March, 1904.

CHARLES W. HARPER.

Witnesses:

ARTHUR F. RANDALL,
JOSEPH T. BRENNAN.