No. 858,739. PATENTED JULY 2, 1907.

F. W. MEDHURST.

COMBINED PORTABLE TELEPHONE AND TELEGRAPH INSTRUMENT.

APPLICATION FILED MAR. 8, 1907.

2 SHEETS—SHEET 1.

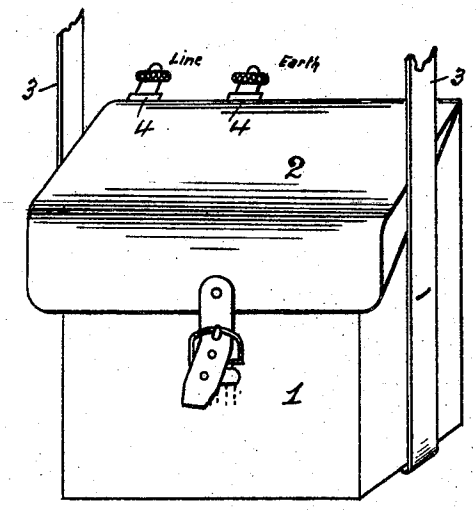


Fig. 1

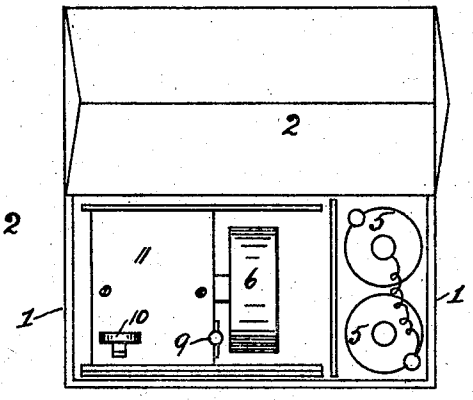


Fig. 2

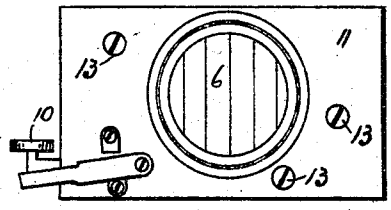


Fig. 3

WITNESSES:

Fred White

René Muine

INVENTOR:

Frederick William Medhurst,

By his Attorneys

Arthur & Raven Mena

No. 858,739. PATENTED JULY 2, 1907.

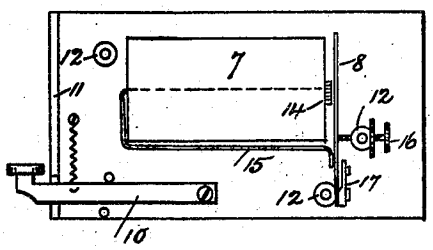
F. W. MEDHURST.

COMBINED PORTABLE TELEPHONE AND TELEGRAPH INSTRUMENT.

APPLICATION FILED MAR. 8, 1907.

2 SHEETS—SHEET 2.

Fig. 4



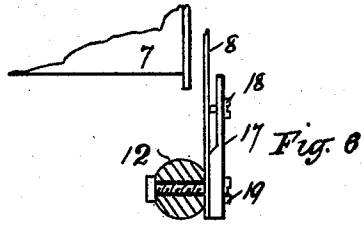


Fig. 6

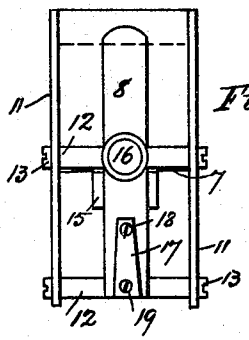


Fig. 5

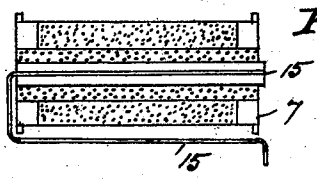


Fig. 7

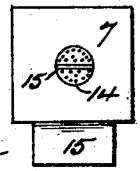


Fig. 8

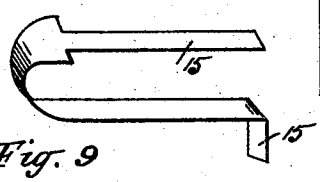


Fig. 9

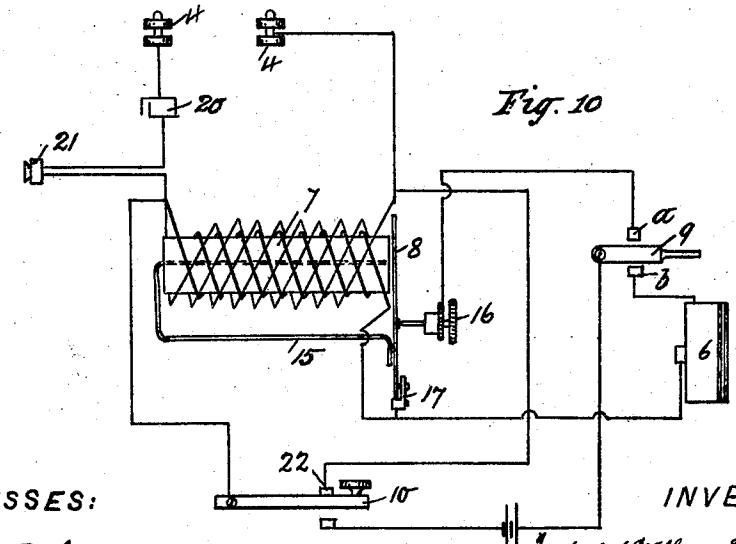


Fig. 10

WITNESSES:

Fred White

René Muine

INVENTOR:

Frederick William Medhurst,

By his Attorneys

Arthur G. Brasert & Co.

UNITED STATES PATENT OFFICE.

FREDERICK WILLIAM MEDHURST, OF HOBART, TASMANIA, AUSTRALIA.

COMBINED PORTABLE TELEPHONE AND TELEGRAPH INSTRUMENT.

No. 858,739. Specification of Letters Patent. Patented July 2, 1907.

Application filed March 8, 1907. Serial No. 361,381.

To all whom it may concern:

Be it known that I, FREDERICK WILLIAM MEDHURST, a subject of the King of Great Britain, residing at Hobart, Tasmania, Australia, have invented new and useful Improvements in a Combined Portable Telephone and Telegraph Instrument, of which the following is a specification.

My invention has for its object to provide a combined portable telephone and telegraph instrument for military, farm and other purposes, all the parts of which, except the receiver, will be securely fixed in a suitable case adapted to be suspended by a strap over the shoulder.

Further, the instrument is such that it may be used without removing any of its parts, save the receiver, from the case.

The mechanism comprises a call, transmitter and receiver, telegraph key and switch, and a coil, dry cells and condenser.

The coil is fitted with an extra pole piece and is wound as a spark coil giving a high frequency with the reed that is used for calling and signaling.

Hitherto, in portable telephone apparatus, the hand combination receiver and transmitter has been mostly used, which has to be carried separately from the main case, if the latter is of a handy size, thereby rendering it liable to injury and a consequent derangement of the whole instrument.

In mounted infantry operations, it is of primary importance to use an instrument which will not suffer in efficiency when subjected to the rough handling such a service demands. It is therefore necessary to so secure all the parts that no amount of ordinary rough handling will affect them, while at the same time the whole instrument will be small enough to be easily carried on horse-back and capable of being quickly connected up to a line for operation.

After much careful experiment and thought I have devised and so disposed the parts forming my instrument as to insure efficiency in the conditions prevailing in a mounted infantry scouting unit. By means of binding screws exteriorly placed, the operator may connect up the line and earth without opening the case and may even speak with it closed.

I preferably use in my instrument a receiver of the Mix and Genest adjustable watch type, wound to about 300 ohms, and a granular transmitter, preferably Antwerp pattern.

The key is so disposed that the cells and a secondary coil are cut out irrespective of the position of the switch when the key is in its normal position. At the same time the receiver is left in circuit with the line for the purpose of receiving a call or signals, thus insuring that unnecessary resistances and impedance are avoided.

In the accompanying drawings: Figure 1 is a general view of the case containing my instrument. Fig. 2 is a plan with the lid opened. Fig. 3 is a side elevation of the compartment in which the coil and reed are secured. Fig. 4 is an interior view of same, one side being removed for purposes of observation. Fig. 5 is an end elevation of same, showing reed and bolts. Fig. 6 is a detail illustrating means for tuning the reed. Fig. 7 shows the coil and extra pole piece in longitudinal section, and Fig. 8 is an end view of the coil. Fig. 9 is a perspective view of the extra pole piece and Fig. 10 a diagram of the wiring employed in the construction of the instrument.

The case 1 may be of leather or other suitable material and is provided with a lid 2 and strap 3, that is long enough to be looped to pass over the shoulder. At the rear edge of the case are the terminal screws 4, 4, one being for the line and the other to earth: by means of these screws it will be very easy to connect or disconnect as occasion demands.

The case is divided into two parts, one compartment containing a pair of dry cells 5, while in the other is the transmitter 6, coil 7, reed 8, switch 9, and key 10.

The coil and reed mechanism are securely mounted in a special ebonite compartment 11, that is rendered stable by cross bolts 12, which act as distance pieces between the sides of the compartment. The bolts 12 butt against the inside of the cheeks of the compartment and can be secured to said cheeks by the screws 13 or by nuts or other means. Were it not for this form of construction, that rigidity which is necessary for the efficiency of the reed would probably be lost during rough handling. Should the mounting of the reed be permitted to move even slightly, the reed will be liable to vary or fail as a call or signal, thereby giving a deceptive note or none at all. By means of the device hereinafter to be explained, I can set or tune the reed.

Referring now to the construction of the coil, Figure 7 shows a longitudinal section of same in which I employ a primary and secondary winding. The core is made up of a bundle of iron wires to about half an inch in diameter, in which is embedded part of an extra pole piece 15. This piece is shown in Fig. 9, and is cut down to permit of its becoming part of the core. It is bent downwards from the rear of the coil and brought forwards underneath and again bent, to present a broad surface to the reed 8. By means of this construction, I get a greater magnetic pull and am thus able to reduce the battery power without loss of efficiency. I have found that with two dry cells giving three volts, enough power is obtained to communicate over long distances, with a considerable margin of battery power.

For the primary winding of the coil, I use preferably four layers No: 22 S. W. G., and for the secondary, about 250 ohms No: 40, S. W. G., each layer insulated with paraffin paper, and the whole being thoroughly insulated to insure a high tension.

I employ two of the bolts 12 (see Figs. 5 and 6) to carry respectively the reed 8, plate 17 and adjustment screw 18, and adjusting screw 16. By means of the plate 17 and screw 18, the note of the reed may be varied according as the screw is operated. It is thus possible to obtain a note from the reed that can be made to synchronize with the diaphragm of a Mix and Genest adjustable clamped diaphragm watch receiver. It will, of course, be necessary to use a special reed, which should be made of ordinary hoop iron and should not exceed two inches in length and half an inch in width, the platinum contact operating about seven eighths of an inch from the clamping screw 19.

Referring to Fig. 10, it will be seen that for using the instrument, no other connections are necessary except those for line and earth by means of the screws 4, 4. On account of the high efficiency of the combination, the earth connection may be dispensed with over short distances by placing the thumb and finger on the earth terminal or by holding the earth wire in the hand.

Assuming the instrument to be normal, an incoming signal will pass through the condenser 20, which may or may not be used, to the receiver 21, and thence through the key 10 and back stop 22, direct to earth. The operator will then close the key which, with the switch at *a*, will return the call or signal, and if it is at *b*, will place the transmitter in circuit. The depression of the key also throws the secondary coil into the receiver circuit.

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

1. In a combined portable telephone and telegraph instrument, a high tension coil, an extra pole piece in said coil, and a reed, and means for altering the note of such reed.

2. In a combined portable telephone and telegraph instrument, in combination, a case, and terminal binding screws exteriorly situated thereon, a high tension coil with extra pole piece and reed contained in the case in a special compartment rendered stable by butt bolts or distance pieces, a receiver of the type mentioned, a key for signaling through the receiver, and a transmitter, switch and cells, the whole, save the receiver, being securely fastened in the case and so disposed as to be accessible for use on opening the lid of the same, as set forth, and operating in the manner explained.

3. In a combined portable telephone and telegraph instrument, in combination, a high tension coil and an extra pole piece which is part of its core and that is bent in the manner explained, a reed, and a plate and a screw for altering at will the note of the reed, as herein set forth.

4. The combination in a portable telephone and telegraph instrument, of an outer rectangular-shaped case and an inner compartment the sides of which are rendered rigid by butt bolts or distance pieces, a coil having an adjustment screw mounted on one of said distance pieces, and a reed and tuning mechanism operating with the coil mounted on said distance pieces, as herein described.

5. The combination in a combined portable telephone and telegraph instrument, of a case having line and earth terminals exteriorly situated thereon, and two inner divisions in one of which are cells and a receiver, and in the other a compartment mounting a coil, a reed or sounder, a transmitter, key and switch, the whole being so disposed and arranged that upon connecting the case to the line and earth by the screws aforesaid, telephone and telegraphic messages may be sent and received without removing any of the parts, save the receiver, from the case.

In witness whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

FREDERICK WILLIAM MEDHURST.

Witnesses:

R. N. NEWTON,

P. H. PRETYMAN.