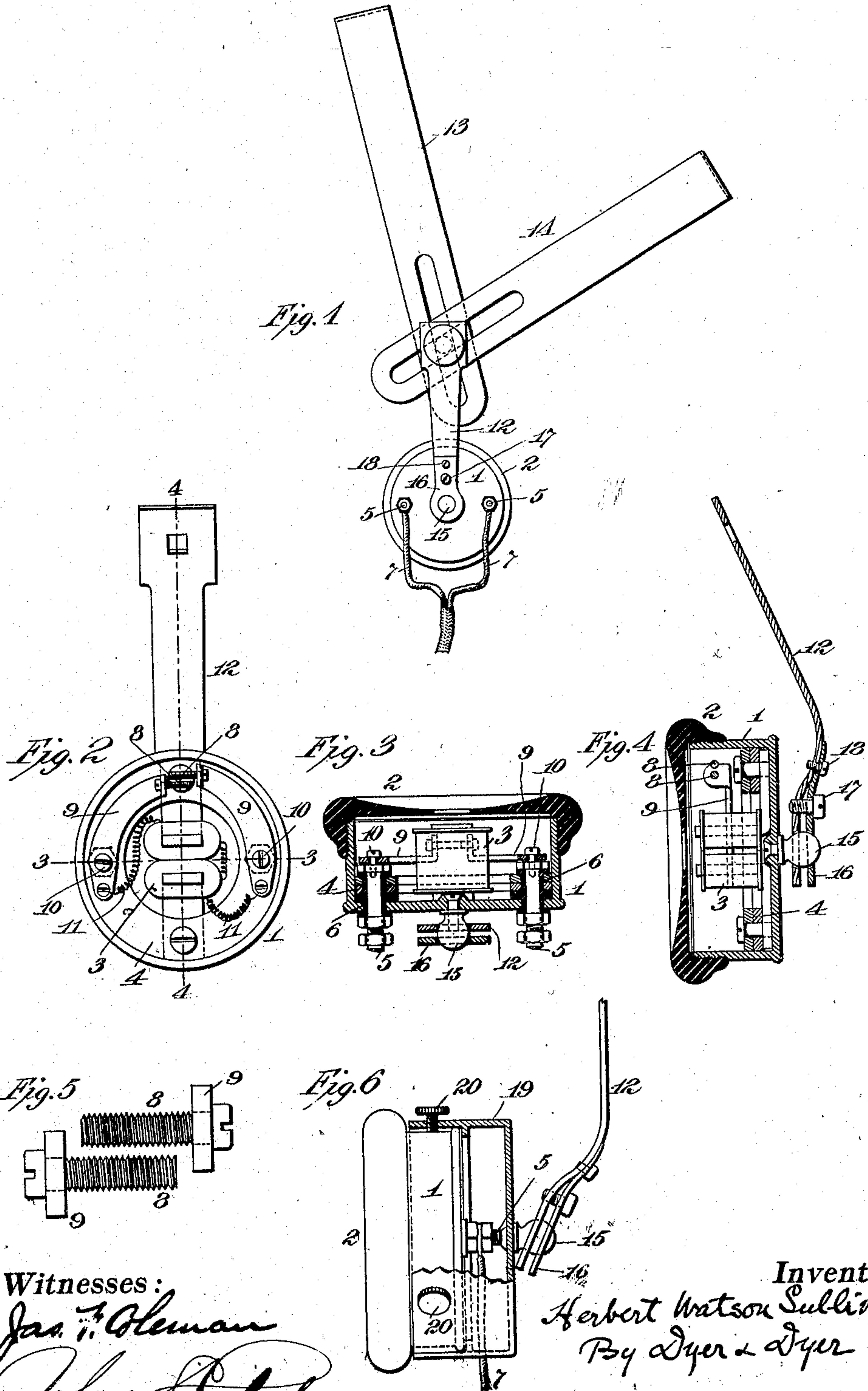


H. W. SULLIVAN.
 TELEPHONE RECEIVER.
 APPLICATION FILED NOV. 30, 1907.

911.178.

Patented Feb. 2, 1909.



Witnesses:
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UNITED STATES PATENT OFFICE

HERBERT WATSON SULLIVAN, OF LONDON, ENGLAND.

TELEPHONE-RECEIVER.

No. 911,178.

Specification of Letters Patent.

Patented Feb. 2, 1909.

Application filed November 30, 1907. Serial No. 404,535.

To all whom it may concern:

Be it known that I, HERBERT WATSON SULLIVAN, a subject of the King of Great Britain and Ireland, and a resident of London, England, have invented an Improvement in Telephone-Receivers, of which the following is a specification.

The object of my invention is to improve telephone receivers of the kind which are carried upon a head support.

Another object of my invention is to prevent injury to the windings of the magnet by high tension currents, such means being protected from mechanical injury.

I attain these objects by the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a telephone receiver embodying my invention. Fig. 2 is a front view on an enlarged scale with the ear piece and diaphragm removed. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is a section on the line 4—4 of Fig. 2. Fig. 5 is a detail view of a mechanism for producing the spark gap; and Fig. 6 is an elevation partly in section of a modified form of receiver.

In all of the views like parts are designated by the same reference characters.

The receiver comprises a casing 1, which may be of any suitable material, with an ear piece 2. The magnets 3 lie within the casing, and are mechanically connected to the annular pole-piece 4. This annular pole-piece 4 lies within the casing, which latter is preferably cylindrical, as shown. The bolts 5 pass through that wall of the casing opposite the ear piece, and mechanically connect with the annular pole-piece 4, but are electrically insulated therefrom by the sleeves 6. The bolts 5 outside of the casing are provided with connections, as shown, for the wires 7, in the usual manner.

The spark gap is shown as produced by means of the screws 8—8, which lie substantially parallel to one another, but a sufficient distance apart so as to produce the gap. Each screw is carried upon an arm 9, which is pivoted upon the inner end of the bolt 5 by means of a screw 10. The free end of the arm is bent up, as shown, provided with a central opening, through which passes the screw 8. By tightening the screws 10 the arms are held rigidly in position; by loosening them, each arm may be swung upon its pivot, and the screws 8—8 may be adjusted

toward or away from each other. The arms 9 are electrically connected with the bolts 5, and are provided with flexible connections 11 to the coils of the magnets 3. It will be apparent from this arrangement, as shown in Fig. 2, that the spark gap produced by the screws 8—8 is in shunt with the coils of the magnet. The extent of separation of the parts producing the gap may be adjusted, and as all parts lie within the casing they are protected from mechanical injury. The screws 8—8 serve as a convenient means for producing a spark gap with multiple points, each thread of the screw constituting a point. The screws also have an advantage in that when the sharp edge of the thread becomes roughened by the passage of sparks across the gap, the screw may be given a partial turn, and another part of the thread will be brought into position to form the spark gap.

The receiver is so mounted upon the head support that it may be adjusted in any position, vertical, horizontal or any intermediate plane, to readily accommodate itself to the ear of the operator. To secure this desirable result, the casing 1 is carried upon the arm 12 by a ball and socket joint. The arm 12 is connected to the head supporting bands 13—14 by means of the usual bolt, the ends of the bands having slots so as to adjust them to rest upon heads of different sizes. The end of the arm 12 has a hole in it which rests against the ball 15, such ball being attached to that side of the casing 1 opposite the ear piece. The opening in the arm 12 is of less diameter than the ball, as shown in Figs. 3 and 4, so that it is impossible to remove the arm from the ball unless the ball is first removed from the casing.

For the purpose of completing the joint, a plate 16 is provided, such plate being provided with an opening also smaller than the ball. This plate is shown in the drawings as connected to the arm 12 by an adjusting screw 17. By means of this screw the plate 16 can be moved toward the arm 12 and the ball 15 pressed between them, the plate always lying upon one side of the largest diameter of the ball, and the arm always lying upon the other side. An additional screw 18 may be provided for holding the plate in position upon the arm.

For the purpose of admitting the ready application of the adjustable support to existing telephone receivers without the necessity of dismantling or partly reconstructing

them, I may mount the ball and socket joint upon a separate casing 19 (see Fig. 6), such casing being provided with clamping screws 20 for engagement with the existing form of receiver.

In accordance with the provisions of the patent statutes, I have described the principle of my invention, together with the apparatus which I now consider to represent the best embodiment thereof, but I desire to have it understood that the apparatus shown is merely illustrative and that the invention can be carried out in other ways.

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

1. A telephone receiver having a spark gap in shunt with the magnets and located within the casing.
2. A telephone receiver having a multiple point spark gap in shunt with the magnets and within the casing.

3. A telephone receiver having a spark gap in shunt with magnets and within the casing, said gap being adjustable as to distance of separation.

4. A telephone receiver having a spark gap in shunt with the magnets and within the casing, said gap being formed with screws lying substantially parallel and separated by an interval producing the gap.

5. A telephone receiver having in combination the operating magnets and the casing, with arms pivoted within the casing, means for adjusting the position of the arms and screws on the free ends of the arms, the said screws lying substantially parallel to one another and constituting a spark gap.

This specification signed and witnessed this 19th day of November, 1907.

HERBERT WATSON SULLIVAN.

Witnesses:

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