

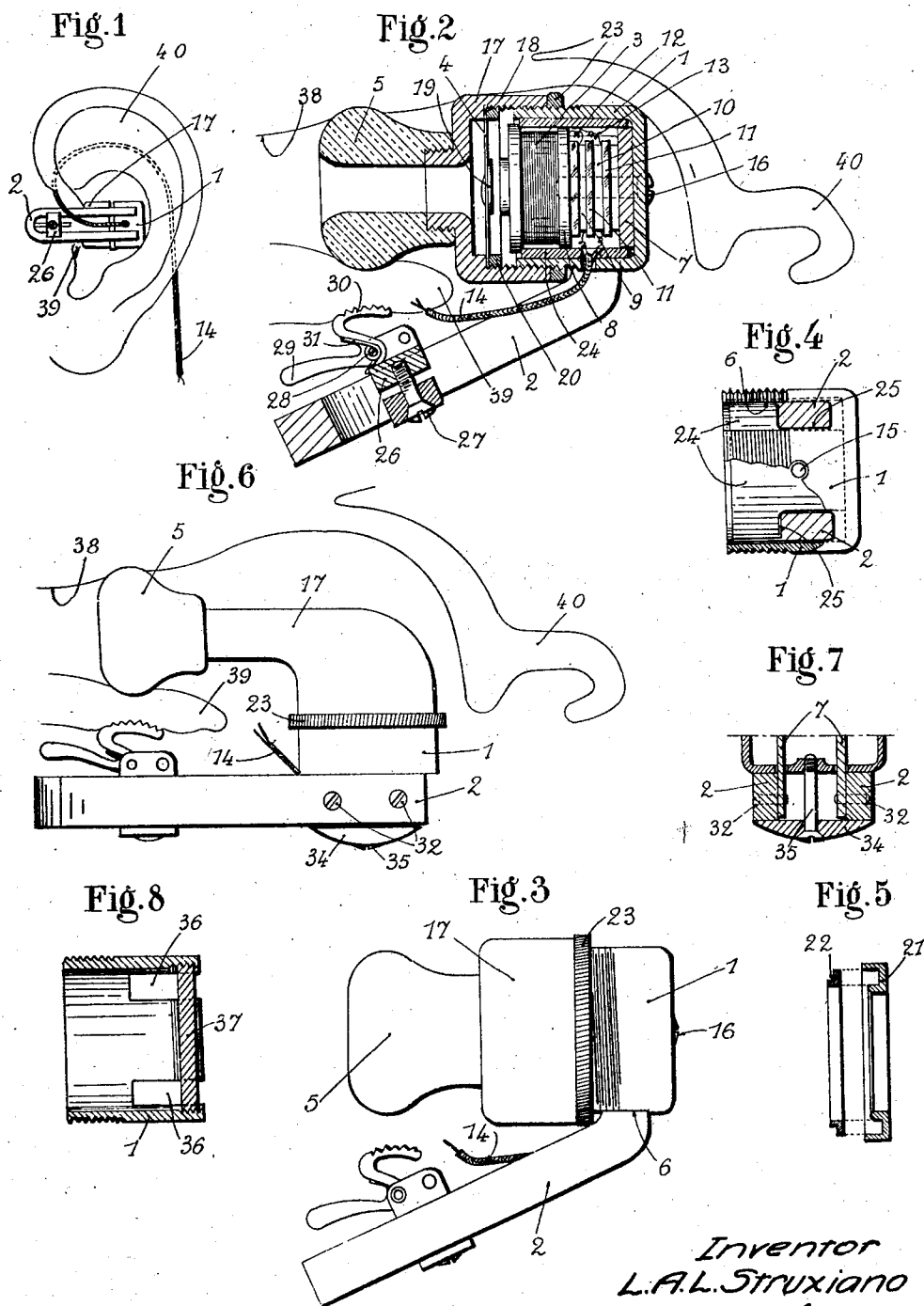
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TELEPHONE RECEIVER

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TELEPHONE RECEIVER.

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To all whom it may concern:

Be it known that I, LUCIEN ALEXANDRE LOUIS STRUXIANO, citizen of the French Republic, residing at Paris, in the French Republic, have invented new and useful Improvements in Telephone Receivers, of which the following is a specification.

This invention relates to a telephone receiver of a very small and light construction which may be partly introduced into the ear of the user. Said apparatus may be used for medical purposes, for auricular prosthesis for detecting electric currents in electric apparatus or lines, for usual telephony, for detecting sound either in earth, air or water and in all cases where it may be deemed advisable to substitute the improved apparatus for the usual telephone receiver carried by the hand or by the head. The improved receiver will be used with advantage by all telephone operators and especially in radiotelegraphy or radio telephony. The improved apparatus is of a very simple and light construction and it has the important advantage that it offers a great stability in the ear and does not risk to be dropped accidentally.

One characteristic feature of the apparatus resides in that it comprises a casing which contains the telephone receiver proper and is provided at its front end with a nipple adapted to be inserted into the ear conduit and the magnet, which is preferably of horse-shoe shape is supported at its rear end by the rear end of the casing, the axis of the magnet and the axis of the nipple being contained in a substantially horizontal plane.

Other characteristic features of the invention will appear from the following description.

In the accompanying drawing given by way of example:

Fig. 1 is a side elevation view of the improved receiver carried in the ear.

Fig. 2 is a horizontal section of the same on a much larger scale.

Fig. 3 is a plan view.

Fig. 4 is a detail showing an inner reinforcing sleeve.

Fig. 5 is a detail of a fastening device which may be used for holding a flexible membrane.

Fig. 6 is a plan view showing a modified construction.

Fig. 7 is a partial vertical section show-

ing the method of securing the ends of the magnet to the casing.

Fig. 8 shows in vertical section a modified construction of the casing.

In the construction shown in Figs. 1 to 3, the telephone receiver comprises a cylindrical casing 1 of nonmagnetic material, closed at its rear end and carrying at its front end the cap 17 and the nipple 5 which will be introduced into the ear conduit of the user, so that in operation the casing will assume a substantially horizontal position. A magnet 2 of horse-shoe shape is secured at its rear end to the rear end of the casing and extends forwardly in a substantially horizontal direction, the semi-annular end of the magnet being foremost so that in operation the axis of the nipple 5 which enters the ear conduit and the longitudinal axis of the magnet lie in a substantially horizontal plane. The free ends of the magnet, located at the rear, are bent at an angle, as shown in Fig. 2 and said ends are inserted into the casing 1 through two longitudinal slots 6 provided in the latter. The ends of the magnet are widened and bear respectively upon the front faces of two soft iron core members 7 having a vertical portion in contact with the end wall of the casing 1. Two screws 6 are provided for securing the magnets and the core members to the casing. Each core member 7 has a portion bent horizontally and two energizing coils 3 of oblong shape are placed on said portions, the upper coil only being shown in Fig. 2.

In the space between the coils 3 of the vertical portions of the core members 7, are mounted two thimbles 9, 10 of conducting material which surround the horizontal portions of the core members 7. Said thimbles are insulated by suitable insulating washers 11. Around the thimbles 9 are placed the feeding wires 12 for the coils and around the thimble 10 are the outlet wires 13. One of the wires of the outer flexible conductor 14 is attached to one of the thimbles and the other wire of said conductor is connected to the other thimble. The conductor 14 leaves the casing through a hole 15 (Fig. 4). The thimbles are clamped by the screws 16 between the inner flanges 8 of the coils and the vertical parts of the core members 7 together with the intervening insulating members, the thimbles being bored for the

passage of the screws in order to provide for insulation.

Screwed upon the casing 1 is the cap 17 carrying the nipple 5 which will be introduced into the auricular conduit. Said cap made of non-magnetic material contains the vibrating membrane 4 having the soft iron armature 19 cemented or riveted thereon. When the membrane or diaphragm 4 is made of rigid material (steel plate, ivory, mica, fibre etc.) it is simply held against an inner shoulder 18 of the cap 17 by a screw-threaded washer 20.

When the membrane is flexible and made of animal, vegetal or woven material, it is clamped between two rings 21, 22 (Fig. 5). The membrane is placed upon the ring 21 and the ring 22 is pressed into the annular slot of ring 21, whereby the membrane is properly stretched. The outer edge of the ring 21 is then spun or turned over the ring 22 and the membrane is thus securely held and cannot become slack. The membrane holder formed by the rings 21, 22, together with the membrane, is then placed into the cap 17 and held in position by means of the screwthreaded ring 20. The ring 21 could also be screwthreaded and screwed into the cap 17, the ring 20 being then omitted.

When the membrane has been secured inside the cap 17, the distance between the armature 19 and the coils should be suitably adjusted, which is effected by screwing on or unscrewing the cap or cover 17 upon the casing 1. When the desired position has been obtained, the cap 17 is clamped in position by means of the ring nut 23.

In order to strengthen the lateral wall of the casing 1 which is somewhat weakened by the longitudinal slots 6 and the hole 15 formed therein, a reinforcing sleeve 24 (Figs. 2 and 4) is inserted into said casing. Said sleeve is provided at one end with two notches 25 for the passage of the arms of the magnet 2.

A slidable member 26 is clamped by means of the screw 27 either on both magnet arms or on one of said arms, outside the casing, said member carries a vertical stud 28 upon which is pivoted an S-shaped lever 29 comprising a serrated or hollow plate 30.

A small spring 31 acts to press said plate against the tragus of the ear which is thus clamped between said plate and the nipple 5. Said clamping device assists in holding the apparatus in the proper position within the ear.

In order to expose the inner parts of the apparatus, it will be sufficient to unscrew the cap 17 and screws 16, whereby the casing 1 may be removed by a sliding movement towards the right (Fig. 2).

In the construction shown in Figs. 6 and 7, the cap 17 has an angular shape and the

magnet arms are straight-shaped i. e. their free ends are not bent laterally as in the former construction. As shown in Figs. 6 and 7 they do not extend inside the casing 1. They lie flat against the end wall of the same and are secured by screws 32 to the outer ends of the core members or plates 7 which extend through the end wall of the casing. The magnet together with the parts carried thereon are clamped upon the casing 1 by the washer 34 and screw 35 screwed into the end wall of the casing.

In this latter construction, the ends of the magnet arms could also extend into the casing as in the construction above described.

The magnet arms could also be bent to an obtuse angle as shown in Figs. 1 to 3 and held against the outer face of the end wall of the casing 1 as shown in Figs. 6 and 7, the cap 17 being straight as shown in Figs. 1 to 3.

According to Fig. 8, the casing 1 has no end wall and it is closed at its outer end by a screw-threaded circular plug 37. Two notches 36 are formed in the tubular casing 1 for the magnet arms, which are clamped in position by the plug 37.

In order to use the apparatus, the nipple 5 of the cap 17 is introduced into the ear conduit 38 whereby the magnet will lie in a substantially horizontally position.

It will be seen that under these conditions, the weight of the magnet will tend to firmly hold the apparatus within the ear, the weight of the semi-annular end of the magnet setting up a vertical component at a point forward of the nipple 5 which will tend to engage said nipple into the ear conduit.

Before inserting the nipple 5 of the apparatus into the ear, the clamping member 26 has been brought to such a position along the magnet that the plate 30 of the lever 29 may slightly press the base of the tragus of the ear under the action of spring 31, as shown in Figs. 2 and 6, which will increase the stability of the apparatus and assist in holding the same firmly upon the ear.

The flexible conductor 14 which extends from the rear part of casing 1, at a point between the magnet arms, is placed around the external ear 40 extending first forwards and then rearwards so that any tractive effort exerted upon said conductor will tend to force the apparatus into the ear. It will thus be seen that by means of the features above described, there is no danger of the apparatus dropping from the ear, or becoming loose in the same.

In the case of an ear having an irregular conformation, which would give rise to some difficulty in suitably holding the apparatus in position, a thin rod or wire bent in accordance with the shape of the ear may

be inserted at one end into a small hole provided in the slidable member 26, said rod or wire being carried around the ear and acting as a support for the apparatus.

5 Various changes may obviously be made in the constructions described without departing from the spirit of the invention and the scope of the appended claims. For instance, the conductor 14 could leave the casing through a hole in its rear wall instead of passing through a lateral hole as shown in the drawing.

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

15 1. A telephone receiver adapted to be carried by the ear and comprising in combination a casing, a nipple secured to the front end of said casing and adapted to be inserted into the ear conduit, an electromagnetic device in said casing for regenerating sounds, a flexible electric conductor and a permanent magnet, both operatively connected to said electromagnetic device, the magnet being supported at its rear end by the rear end of the casing and the axis of the magnet together with the axis of the nipple being contained in a substantially horizontal plane.

20 2. A telephone receiver adapted to be carried by the ear and comprising in combination a casing, a nipple secured to the front end of said casing and adapted to be inserted into the ear conduit, an electromagnetic device in said casing for regenerating

sounds, a flexible electric conductor and a permanent magnet, both operatively connected to said electromagnetic device, the magnet being supported at its rear end by the rear end of the casing and the axis of the magnet together with the axis of the nipple being contained in a substantially horizontal plane and clamping means adjustably mounted on the magnet and adapted to clamp the tragus of the ear against the said nipple.

3. A telephone receiver adapted to be carried by the ear and comprising in combination a casing, a nipple secured to the front end of said casing and adapted to be inserted into the ear conduit, an electromagnetic device in said casing for regenerating sounds, a flexible electric conductor and a permanent magnet, both operatively connected to said electromagnetic device, the magnet being supported at its rear end by the rear end of the casing and the axis of the magnet together with the axis of the nipple being contained in a substantially horizontal plane, the said flexible electric conductor extending from a point of the casing at the rear part thereof and being adapted to pass around the ear in a rearward direction, whereby the traction which said conductor is adapted to exert on the receiver will serve to press said receiver against the ear conduit.

In testimony whereof I have signed my name to this specification.

LUCIEN ALEXANDRE LOUIS STRUXIANO.