Feb. 19, 1952 R. C. GILBERT 2,586,644

HEADSET

Filed Feb. 10, 1949 2 SHEETS—SHEET 1

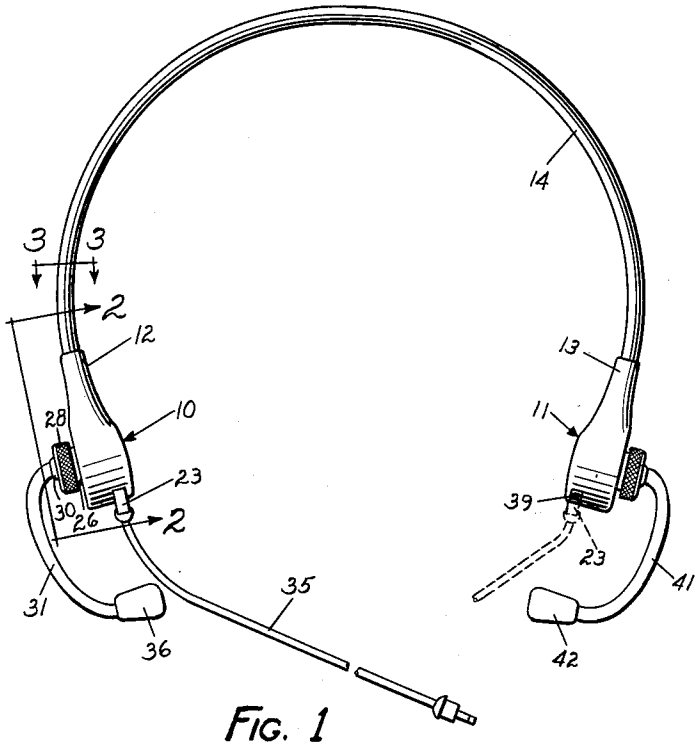


FIG. 1

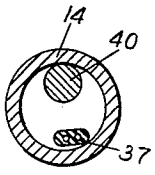


FIG. 3

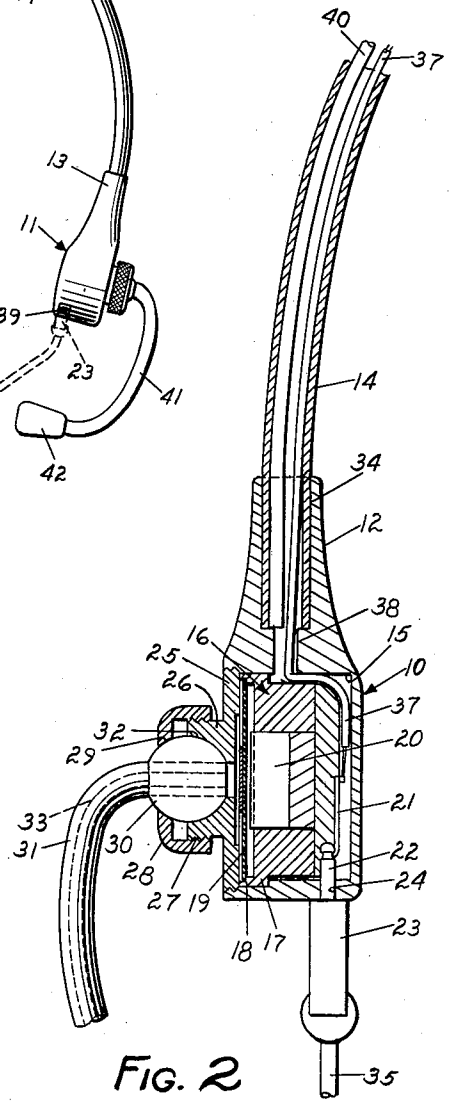


FIG. 2

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HEADSET

Filed Feb. 10, 1949 2 SHEETS—SHEET 2

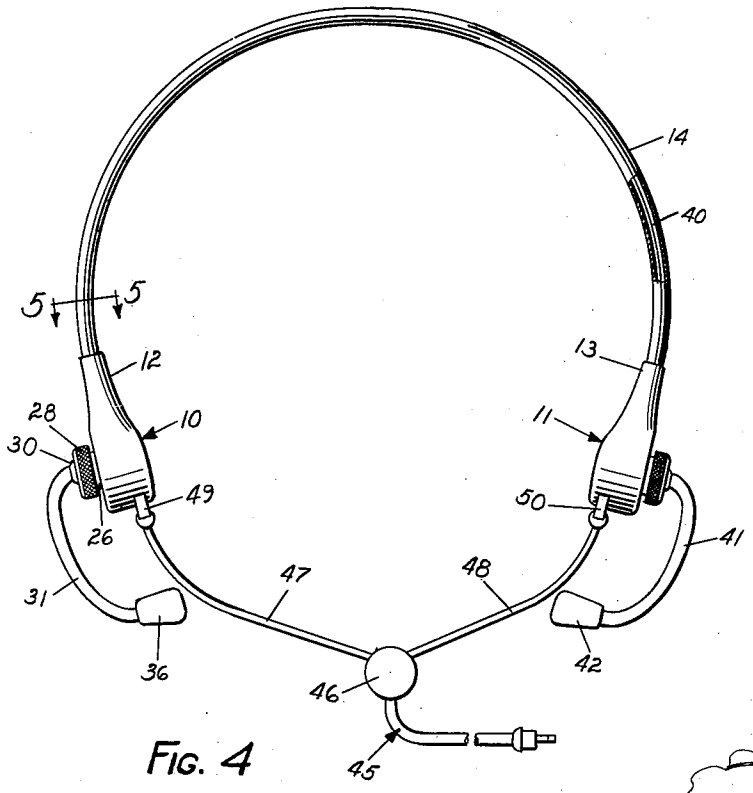


FIG. 4

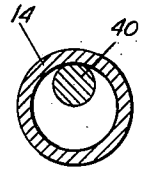


FIG. 5

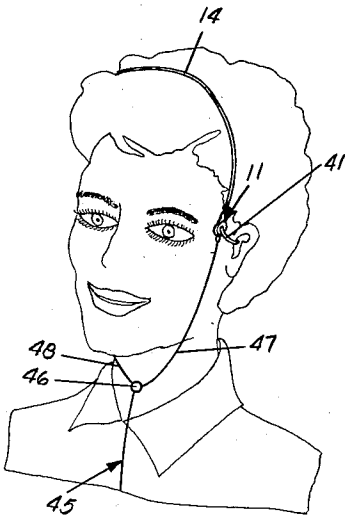


FIG. 6

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# UNITED STATES PATENT OFFICE

2,586,644

## HEADSET

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9 Claims. (Cl. 179—156)

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This invention relates to head sets and more particularly to light-weight head sets of the type which are worn by telephone operators, dictaphone transcriptionists and others over long periods of time. Head sets have previously been provided wherein the sound reproducer units are mounted so as to provide direct communication from the sound reproducer unit to the ear. In such head sets the sound reproducer units have been mounted so as to fit over the ear of the user when the head set is used. In other head sets there have been provided a sound reproducer unit suspended below the chin of the wearer and provided with a harp or wishbone-shaped ear tubes leading to ear tips that are placed in the ears of the operator. All of the foregoing types of head sets are subject to the disadvantage that a certain amount of pressure is applied to the ear of the wearer, which is a sensitive portion of the body and is subject to the disadvantage that such pressure, however slight, when long continued may cause some discomfort of the wearer.

It is an object of the present invention to provide an over-the-head head set which can be worn by the operator for extended periods of time without pressure on the ears of the wearer.

It is more particularly an object of the invention to provide an over-the-head head set wherein the sound reproducing units are worn adjacent the ear and the sound communicated therefrom to ear tips which may be adjusted to any position in proximity with the ear, and either in or out of contact therewith.

It is a further object of the invention to provide an improved, light-weight, over-the-head head set having dual sound reproducer units and also to provide an over-the-head head set having sound reproducer units which, when worn by the operator, are located adjacent the ear and sound conduits provided therefrom equipped for adjustment so as to bring the conduit into close proximity or contact with the ear canal as desired.

Other and further objects of the invention include the provision of an improved light-weight head set having adjustable ear tips on the sound reproducer units and to provide an improved head set having a single or double cord arrangement to dual sound reproducer units of the head set.

Other and further objects of the invention are those inherent in the apparatus herein illustrated, described and claimed.

The invention is illustrated with reference to the drawings in which corresponding numerals refer to the same parts and in which:

Figure 1 is a front elevational view of one form of the invention;

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Figure 2 is an enlarged fragmentary longitudinal sectional view taken along the center line of one of the sound reproducer units of the head set shown in Figure 1 and in the direction of arrows 2—2 of Figure 1;

Figure 3 is an enlarged sectional view taken along the line and in the direction of arrows 3—3 of Figure 1;

Figure 4 is a front elevational view of a slightly modified form of the invention;

Figure 5 is an enlarged sectional view taken along the line and in the direction of arrows 5—5 of Figure 4;

Figure 6 is a quarter front view of an individual wearing the head set of Figure 4.

Referring to Figures 1, 2 and 3 there is illustrated a head set having duplicate sound reproducer casings generally designated 10 and 11, each of which terminates in a side arm 12 and 13 into which a tubular head bow 14 of plastic material or the like is inserted. The construction of the sound reproducer casings 10 or 11 is illustrated by the sectional view shown in Figure 2 wherein it will be noted that the casing is provided with a recess 15 into which the sound reproducer unit generally designated 16 is adapted to repose. The second reproducer unit 16 is of minute size of the type customarily used for hearing aid sets for the hard of hearing. The sound reproducer unit includes an exterior frame 17 terminating at a flange 18 in which the diaphragm 19 of the sound reproducer unit is placed, the diaphragm being held in place by the magnetism of pole pieces 20. Coils surrounding the pole pieces, not illustrated, are connected to a pair of terminals, one of which is shown at 21 in Figure 2. The terminals are in the form of clips to receive parallel terminals 22 of a removable plug 23 which when inserted through holes 24 in the bottom portion of the casing permit connection to the terminals and hence to the sound reproducer unit. The casing 10 is provided with a screw plate 25 threaded or pressed into the casing 10 having an upstanding hub portion 26 that is threaded at 27 to receive the cap 28. The cap has a circular opening in its center and is provided with a spherical recess 29 which serves to hold the ball end 30 of short inflexible ear tube 31 which extends out of the hub 11 and terminates at an ear tip 36, see Figure 1. The hub portion 26 has a spherical recess 32 corresponding to the shape of the ball 30 into which the ball portion 30 is placed before the cap 28 is tightened down. The ball 30 is bored so as to receive the ear tube 31 and the ear tube and ball portion provide a tubular conduit 33 through which the

sound emanating from the diaphragm 19 is adapted to pass and be delivered to the ear tip 36.

The side arm portion 12 of the sound reproducer casing is bored out at 34 so as to receive the tubular head bow 14 which is preferably of plastic material, although light-weight metal may also be used. In the preferred embodiment of the invention the entire casing 10 is of molded plastic.

In the form of invention shown in Figure 1 a single cord 35 is provided having a pair of conductors which terminate at a plug 23 having a pair of terminal points of which one, viz. terminal 22, is shown in the sectional view, Figure 2, the other terminal point lying immediately behind the terminal 22. These pin terminals are engaged by a pair of spring terminals on the back of the sound reproducer unit 16, of which one such terminal 21 is shown, the other lying immediately behind, and as previously stated these terminals are connected to the coils of the sound reproducer unit.

Also connected to the terminals are a pair of wires in cord 37 which extends around the rear portion and up one side of the sound reproducer unit and thence through the aperture 38 and into the inside of the tubular head bow 14, whence it extends around to the opposite sound reproducer casing 11, which, as previously stated, is identical with that shown at 10 and in Figure 2 just described. In that sound reproducer casing 11 the cord pair 37 is connected to corresponding terminals on the back of the sound reproducer contained within casing 11. It will be noted that the casing 11 has a pair of apertures at 39 to which the pin terminals of plug 23 may be inserted when it is desired to plug in the cord to the sound reproducer casing 11 instead of to the sound reproducer casing 10, as shown. In this way the operator has freedom of choice in that she may plug the cord 35 into either of the sound reproducer casings, depending upon which side she desired to have the cord hung when the set is worn. Within the tubular head bow 14 there is also placed a springy stiffening wire 40 which provides slight pressure and still, when bent, can be adjusted as to to fit the heads of individual operators.

When the sound reproducer shown in Figures 1–3 is worn on the operator, the sound reproducer casings 10 and 11 are positioned at approximately the temples of the wearer and the ear tubes 31 and 41 extending from the sound reproducer casings 10 and 11, respectively, and terminating in ear tips 36 and 42, are then adjusted by the operator so that the ear tips reach into proximity to the ear canal. It is unnecessary, for satisfactory operation, to have the ear tube actually in contact with the wearer, although some may desire to adjust the ear tubes to such position. Consequently, the wearer may, if desired, adjust the ear tubes so as to receive the sounds delivered by the ear tips 36—42 without enduring any pressure whatever on the ear canel or any portion of the ear, the slight tension of the bow 14 which provides the pressure of sound reproducer casings 10—11 on the wearer being taken instead by the sturdier portions of the head of the wearer, viz. the temples portion. Also, if desired, the wearer may shift the head set from one position to another so as to shift the pressure of the sound reproducer casings 10—11 from one spot to another on the temple or over-ear or behind-ear portions



of the head and in any position the short adjustable ear tubes 31—41 can be repositioned so as to bring the ear tips 36—42 into proximity with the ear canal. This is a distinct advantage when the device is worn for long periods of time.

Referring to the device shown in Figure 4, it is exactly the same as that shown in Figures 1–3 with the exception that the interconnecting pair of wires 37 between the sound reproducer head set is omitted in the over-the-head bow 14. Accordingly, the sound reproducer units within the casing 10 and 11 are not interconnected electrically and for the purpose of communicating the electrical sound-signals to the sound reproducer unit there is provided a branched cord shown generally at 45 terminating in a connection block 46 from which a pair of cords 47—48, which are connected parallel to the wires of cord 45, emanate. The cords 47—48 are each provided with plugs connectors at 49—50, respectively, which are plugged or jacked into the openings provided in the base of the sound reproducer casings 10—11, thus making electrical connections to the sound reproducers therein. As shown in the sectional view in Figure 5 the over-the-head bow 14 includes a stiffening wire 40 as previously described, but there is no electrical connection in the tube 14. Figure 6 is self-explanatory and illustrates one position in which the head set shown in Figure 4 may be worn by the operator. It is to be understood that the twin cord generally designated 45—46—47—48 shown in Figure 6 may be substituted by the unit shown at 35 in the event the head bow 14 has electrical connection between the sound reproducers of the head set, as explained with reference to Figures 1–3.

As many apparently widely different embodiments of this invention may be made without departing from the spirit and scope thereof, it is to be understood that I do not limit myself to the specific embodiments herein.

What I claim is:

1. An over-the-head head set comprising a pair of small sound reproducer units each including an electrical sound reproducer element, said units being mounted at opposite ends of a flexible over-the-head head bow, said sound reproducer units having substantially smooth faces opposing each other and each of said sound reproducer units being provided with a short ear tube movably connected in operative sound-communicating relation thereto, at a point other than said smooth face of the unit for adjustably positioning the ear tube with reference to the unit when the head set is worn, electrical connections between the sound reproducer elements and an exterior cord connected to said elements.

2. An over-the-head head set as set forth in claim 1 further characterized in that the ear tubes are connected to the sound reproducer units by a ball and socket connection having an adjustable frictional engagement for holding the ball connection in any position to which it is adjusted.

3. An over-the-head head set as set forth in claim 1 further characterized in that electrical connection is made between the electrical sound reproducer elements by means of a pair of electric wires contained within the over-the-head bow and plug connections are provided at each sound reproducer unit for receiving a cooperating electrical connection of an exterior cord.

4. A sound reproducer unit of the type set forth in claim 1 further characterized in that parallel electrical connections are made to each sound reproducer element from an exterior supply pair.

5. An over-the-head head set comprising a tubular head bow, a casing connected at each end of the head bow, said casing having a substantially smooth face facing the other casing, a sound reproducer in each casing, each sound reproducer having a diaphragm, each of said casings having a tubular protuberance adjacent the diaphragm providing a conduit through which sounds emanating from said diaphragm may be communicated, said tubular protuberance extending from said casing on a face other than said smooth face and a short adjustable ear tip connected to said protuberance for adjustment to varying angular dispositions relative to the conduit therein, each said ear tube terminating in an ear tip, and electrical connections from the sound reproducer in one casing and through the tubular head bow to the sound reproducer unit of the other casing.

6. The head set described in claim 5 further characterized in that each casing is provided with a pair of spring terminal connections and apertures adjacent thereto for receiving pin connections of an exterior plug cord for supplying the sound reproducers of the head set.

7. An over-the-head head set comprising a tubular plastic head bow, a molded plastic casing at each end of the head bow, each such casing having a relatively smooth face facing the other casing and being provided with a recess for receiving a sound reproducer unit of the hearing aid type therein, each casing having a channel therein communicating with the channel of the tubular head bow, a sound reproducer unit positioned in the recess of each casing, a metallic cap removably attached to the casing, said metallic cap and sound reproducer unit of each casing being formed so that when the cap is attached pressure is placed upon the sound reproducer unit for holding the same firmly within the casing, each said cap having a central tubular boss, having a spherical central recess therein, an apertured cap screw threaded upon said boss and an ear tube, each ear tube terminating in a ball received in said spherical recess and an ear tip on each ear tube.



8. The over-the-head head set of claim 7 further characterized in that electrical connection is provided through the tubular head bow from the sound reproducer unit situated in one plastic casing and connected to the sound reproducer unit situated in the other plastic casing.

9. An over-the-head head set comprising a tubular head bow, a casing connected at each end of the head bow, each of said casings having a substantially smooth face facing inwardly of the bow, a recess extending into each of said casings from a face opposite to the smooth face, a sound reproducer unit of the hearing aid type in each of said recesses, an ear tube adjustably connected to each of said sound reproducer units and extending outwardly therefrom and adapted for variably positioning the ear tube with reference to the unit when the head set is worn, electrical connections between the sound reproducer units and an exterior cord connected to said units.

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