

Dec. 8, 1931.

G. R. LUM

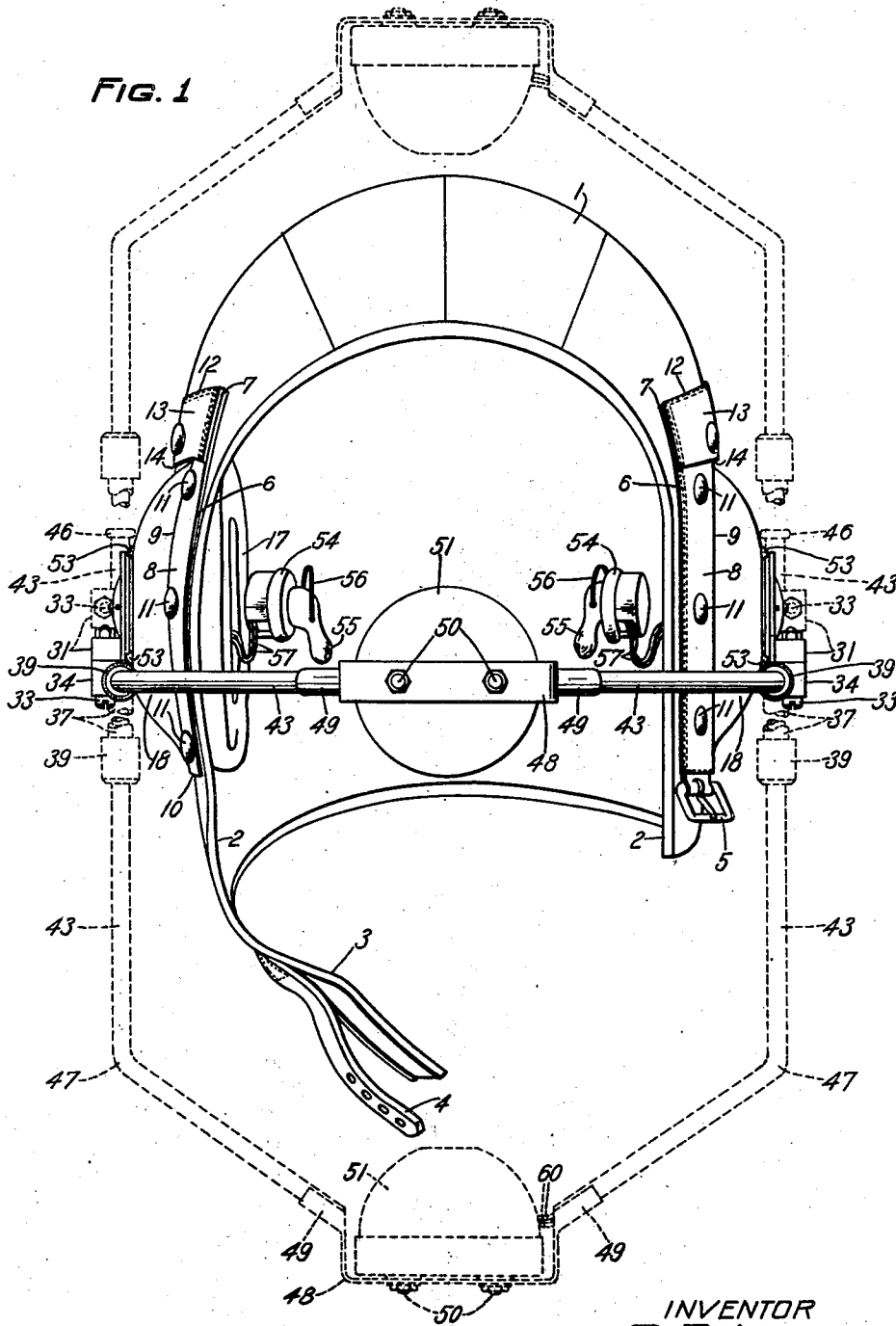
1,835,792

HEADSET

Filed Jan. 25, 1930

3 Sheets-Sheet 1

FIG. 1



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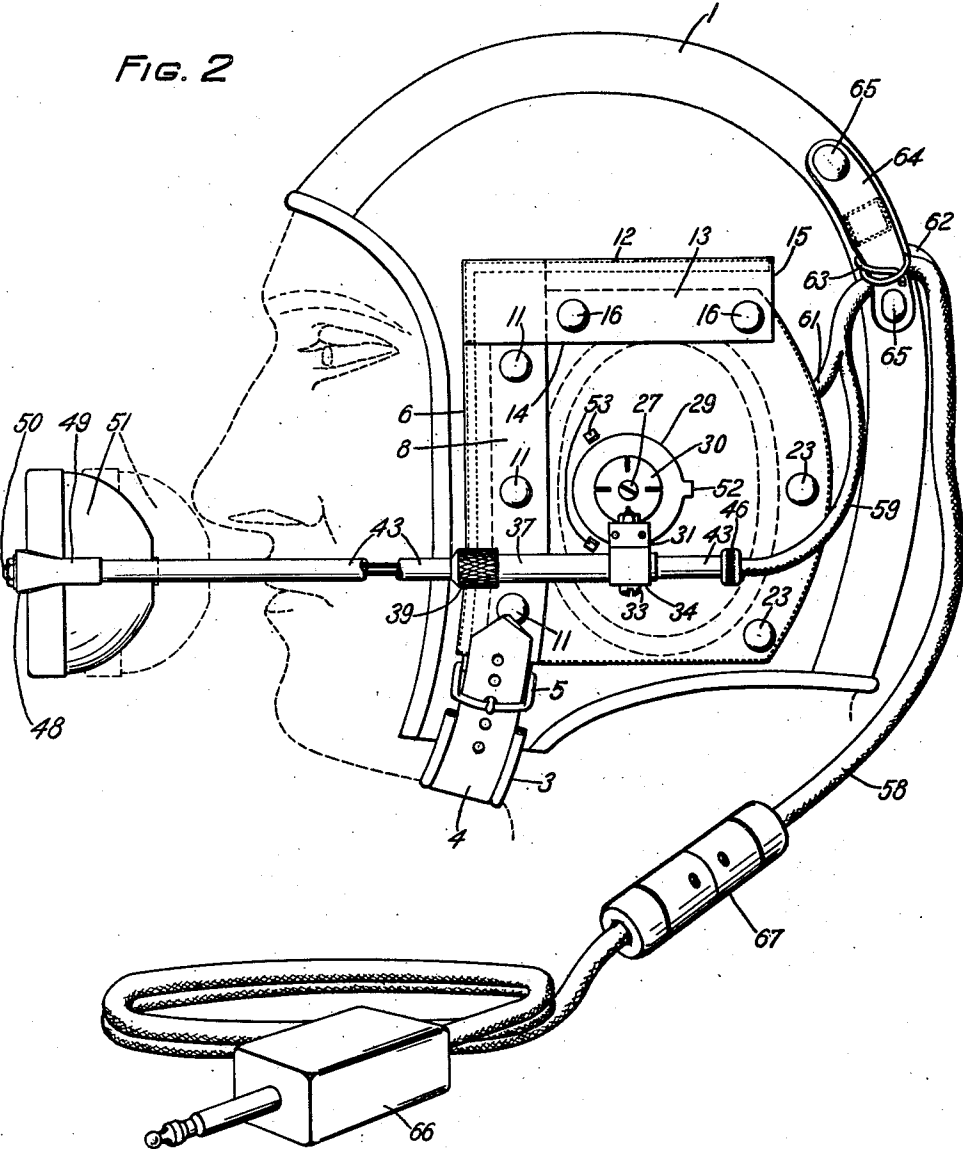
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HEADSET

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FIG. 2



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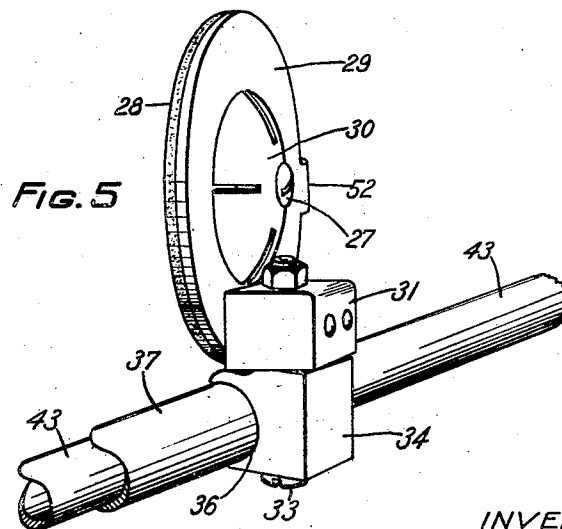
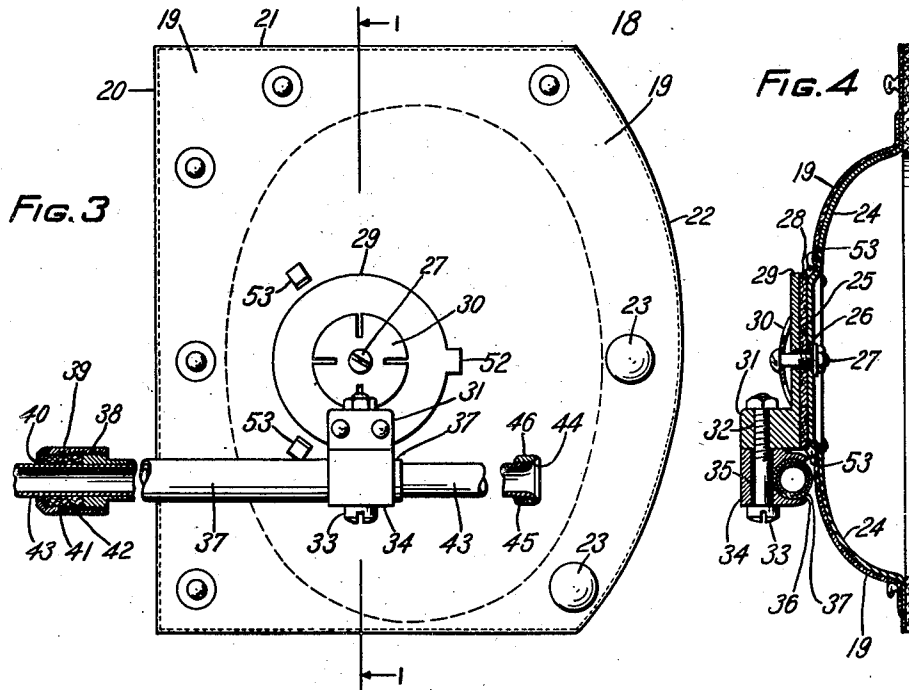
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HEADSET

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

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HEADSET

Application filed January 25, 1930. Serial No. 423,301.

This invention relates to head sets in which both transmitting and receiving elements are included and more particularly to head sets used in combination with protective helmets such as are commonly worn by aviators.

It is an object of this invention to so support the transmitter element in a structure of this type that it may readily be moved relative to the mouth of the user and placed in either talking or non-talking position.

Features of this invention reside in an adjustable arm support for the transmitter which may be moved radially both longitudinally and latitudinally with respect to its supporting points, on receiver holders, and upon which the transmitter may be adjusted toward or away from the operator's mouth, and in detachable ear tab members having therein the receiver holders upon which the transmitter support is pivoted and providing means by which the telephone apparatus as a whole may be attached to or detached from the helmet.

In the accompanying drawings, Fig. 1 is a front elevational view of a modified aviator's helmet equipped with the improved head set, and showing in full lines the transmitter supported in talking position, and in dotted lines two extreme non-talking positions to which the transmitter may be moved;

Fig. 2 is a side elevation of a helmet equipped with the head set apparatus and showing an extension cord and plug by which the head set apparatus may be connected to either radio communication apparatus or a telephone system;

Fig. 3 is a side elevation of a detachable ear patch for a helmet showing fragmentary portions of the transmitter support;

Fig. 4 is a rear view in section taken on the lines 1—1 of Fig. 3 in the direction of the arrows and showing a receiver enclosure member bearing parts of the transmitter supporting means; and

Fig. 5 is a view in perspective of a portion of the transmitter supporting means showing a universal swing joint which is supported by one of the ear covering members as shown in Fig. 4 which permits radial movement of the transmitter both laterally

and perpendicularly. This figure also shows a fragmentary portion of a sleeve supported by the swing joint having telescoped therein an arm or tubular member to support the transmitter, and which permits movement of the transmitter toward or away from the mouth of the user.

In the operation of aircraft or other motor driven vehicles it is frequently desirable or necessary that communication be established between the pilot and the other occupants of the vehicle or between occupants of the vehicle and ground stations. Telephone systems in such vehicles have already been provided for communication between the occupants, and radio communication systems have also been employed to provide communication facilities between the occupants of a vehicle and ground stations.

The operator of a motor driven vehicle frequently finds that it is extremely difficult and at times altogether impossible while operating the manual controls and observing the indicating instruments of the machine to pick-up and hold in talking and listening positions the telephone apparatus. This is particularly true in the operation of aircraft. It has also been found that the noise caused by the motor and propelling apparatus oftentimes is of such magnitude that it becomes impossible to use in communication systems in such vehicles, telephone transmitting and receiving means unless the receivers are shielded from the extraneous noises and the transmitter is positioned close up to the mouth of the operator.

To overcome these difficulties head sets to hold receivers against the ears have been provided and in some structures means to support a transmitter in line with the mouth of an operator have been included. Some difficulty has been had, however, in adjusting these transmitter supporting means and setting them in the most effective positions and it will be readily recognized that an operator cannot well afford to release his hold of the manual controls of the vehicle to make any manual adjustment of the apparatus which would require any comparatively great amount of time. In some of the structures al-

ready in use, transmitters are supported over the mouth of an operator at all times during the operation of the vehicle and must be maintained there during all this time.

5 In this invention the transmitter has been so supported that it may with a minimum amount of manual adjustment on the part of the operator be moved to either talking or non-talking position and set in the most convenient position. Detachable supporting means have also been provided which make it possible to quickly and entirely remove the telephone apparatus from the head of the operator.

15 To further explain this invention reference will now be had to the accompanying drawings in which like numerals represent like parts throughout and in which 1 is a helmet preferably of leather or like material and having apertured ear portions 2—2 which extend downward around the ears of the wearer. 3 is a strap extending from one of the ear portions 2 to pass under the chin and having a perforated tab portion 4 by which it may be secured to a buckle 5 attached to the other ear portion 2.

Sewed to the forward part of each apertured ear portion 2 at 6 and 7 is a vertical rectangular tab 8 having its inner and lower edge portions 9 and 10 respectively free from the helmet, and having accurately spaced apart for a purpose which will be later explained, the female portions 11 of snap fasteners.

35 Across the top of the aperture in each ear portion 2 and sewed onto the helmet 1 at 12 and overlapping and sewed onto the top sewed on portion 7 of the tab 8 is a horizontal rectangular tab 13 having its lower and back edge portions 14 and 15 respectively free from the helmet. This horizontal tab 13 also carries female portions 16 of snap fasteners of the ordinary glove type.

45 On the inside of the helmet 1 and surrounding each aperture in an ear portion 2 is a ring member 17 which is preferably sewed or glued to the inside of the helmet and may be of sponge rubber or some like comparatively soft material and which will serve as a cushion member to be pressed against the outer ear of a wearer.

Detachably secured to the helmet 1 by means of snap fasteners are ear covering members 18 comprising in each case as shown in Fig. 3, an apertured patch like member 19 preferably of the same material as the helmet 1. Each patch member 19 has on its forward and top portions 20 and 21 respectively male portions of snap fasteners corresponding exactly in spacing with the female portions 11 and 16 of the snap fasteners on the vertical and horizontal tab members 8 and 13 respectively. These patch members 19 have also on the back portions 22, female portions 23 of snap fasteners which engage

corresponding male portions which are not shown but are located on the helmet 1.

Carried by each patch member 19 is an ear covering member 24 which may be pressed out of sheet metal or some suitable comparatively stiff sheet material substantially in the form of a flanged oval bowl having an eccentrically located flat surfaced embossing 25 which is round in contour and has a central aperture 26. The ear covering member 24 may be sewed or cemented to the patch member 19 or secured thereto in any manner found practicable, but preferably is substantially enclosed therein as shown in Fig. 4 with portions of the patch member overlapping the curved sides of the bowl.

Rotatably supported by a bolt 27 on the embossing 25 and a washer 28 which is glued to the embossing 25 is a disc member 29 which is spring pressed against the washer 28 by a spring disc 30 which may be adjusted in its spring tension by means of bolt 27. Integral with and eccentrically located on the disc member 29 is a block 31 having therein a transverse boring 32 traversed by a bolt 33 which supports against the under-side of the block 31 a block 34.

The block 34 is bored at 35 to receive the bolt 33 and has a channel 36 in its inner face running transverse of the bolt hole 35. Secured within the channel 36 is a sleeve 37 which has the greater part of its length extending forward of the block 34 as shown in Figs. 2, 3 and 5. The forward end of the sleeve 37 is male threaded at 38 to receive a knurled packing nut 39 which is bored at 40 to the same diameter as the interior of the sleeve 37 and has a packing space 41 to receive a ring of felt packing 42. The length of this felt packing ring 42 preferably is a shade greater than half the length of the inside portion of the packing nut 39 and may be compressed by turning the packing nut 39 further on to the threaded portion 38 of the sleeve 37.

Telescoped within each sleeve 37 is a comparatively long tubular member 43 which traverses the packing nut 39, the bore of the felt packing ring 42, the sleeve 37 and extends beyond the rear portion of the sleeve 37 as shown in Figs. 2, 3 and 5. The free end of tubular member 43 is chamfered at 44 to receive an extension cord and is threaded at 45 to receive a thumb nut 46 which serves as a stop to prevent complete withdrawal of the tubular member 43 from the sleeve 37.

Each tubular member 43 extends forward of its supporting sleeve 37 to a point 47 as shown in Fig. 1 where it bends inward toward a line projected outwardly from a central point in the face opening of the helmet 1, and terminates in a spring strap member 48 having tubular extending portions 49—49 to receive the tubular members 43.

Supported on the spring strap member 48

by bolts or studs 50 is a transmitter 51 which by radial movement of the tubular members 43 may be placed in alignment with the mouth of a wearer of the helmet 1 or swung to various non-talking positions two of which are shown in dotted lines in Fig. 1. The transmitter 51 may also be moved toward or away from the mouth of a user by sliding the tubular members 43 within the sleeves 37 and brought to a position comparatively close to the mouth of a user as shown in dotted lines in Fig. 2 or moved to a comparatively long distance away as shown in full lines.

By turning of the packing nuts 39 further on to the threaded portions 38 of the sleeves 37, the felt packing rings 42 may be compressed to such an extent that they will bind sufficiently on the tubular members 43 to prevent accidental sliding of the tubular members 43 within the sleeves 37. It will also be apparent that by adjustment of the packing nuts 39 on the threaded portions 38, the friction obtained between the felt packing rings 42 and the tubular members 43 may be varied to a point where accidental sliding of the tubular members 43 within the sleeves 37 is prevented but forcible movement of the tubular members 43 within the sleeves 37 by the wearer of the helmet is permitted.

The supporting structures described in previous paragraphs of this specification for supporting the sleeves 37 on the ear covering members 24 and comprising the bolts 27, washers 28, discs 29, blocks 31, bolts 33 and blocks 34 provide universal swing joints which enable the wearer of the helmet 1 to swing the transmitter 51 and its arm supporting structure radially with respect to the pivotal points occupied by the bolts 27 and perpendicularly with respect to the mouth to various talking and non-talking positions, and also from side to side of a line perpendicular to the mouth. By adjustment of the bolts 27 and regulation of the tension exerted on the discs 29 by the spring discs 30, sufficient frictional contact may be obtained between the discs 29 and their cooperating washers 28 to maintain the tubular members 43 in any position they may be radially moved to with respect to the pivotal points on the ear covering members 24. By adjustment of the bolts 33 sufficient friction between the blocks 34 and their respective cooperating blocks 31 may also be obtained to maintain the tubular members 43 in any position to which they may be moved to either right or left of a median line of the face.

To limit the perpendicular swinging of the transmitter on its supporting members to such an extent that it might pass beyond ready reach of the wearer, which would be the case if it were swung completely to the back of the head or neck and to prevent complete turning of the transmitter and its supporting members on the bolts 27 when the helmet is

not being worn, stop members comprising a radial lug 52 on each disc member 29 and a pair of spaced stop pins or lugs 53 on each ear covering member 24 have been provided, which will limit the swinging of the transmitter to a position directly over the head or to a point under the helmet and will allow movement of the transmitter to any position in an arc passing before the face.

Receiver members 54, preferably one for each ear of the wearer, are included in the structure. These may be of the comparatively small type such as are now used in deaf sets and may have projecting portions 55 for inserting into the meatus of the ear and spring members 56 to engage in a crevice of the outer ear to prevent accidental dislodgement of the receiver. The receivers preferably are not attached to either the helmet structure or ear covering members 24, but are loosely suspended within the helmet by their own lead-in wires 57, and may be placed in the ears through the apertures in the ear portions 2—2, after the helmet has been pulled completely down on the head and the strap 4 secured to the buckle 5. The receivers may also be removed through the apertures in the ear portions 2—2 without first removing or loosening the helmet.

To connect the transmitter and the receivers with a telephone system or a wireless transmitting and receiving set a flexible cord 58 is provided. A branch 59 of this cord is led through one of the tubular members 43 and one of the tubular extending portions 49 of the spring strap member 48 and enters the transmitter 51 at a point 60 as shown in Fig. 1. To connect with the receivers 54 two other branches are led off from the flexible cord 58. One of the branches is shown at 61 in Fig. 2 and is inserted between the patch member 19 and the helmet 1 and led in through the aperture in the ear portion 2. The other receiver branch is led off from the cord at 62 and leads around the back of the helmet 1 to the other side of the helmet and is inserted between the patch member 19 and the helmet 1 and so on through the aperture in the ear portion 2 to the receiver 54. To support the flexible cord 58 and prevent any undue strain on the cord from reaching the receivers or the transmitter the cord 58 is lashed at 63 to a goggle strap 64 which is detachably secured to the helmet 1 by snap fasteners 65. On the free end of the cord 58 is a plug 66 which may be inserted in a telephone jack of a telephone or wireless system.

Intermediate of the helmet 1 and the plug 66 is a plug and jack 67 providing intermediate connecting and disconnecting means between the flexible cord 58 leading from the helmet 1 and the continuing portion of the cord which terminates in the plug 66.

In the structure above described the complete telephone head set including the trans-

mitter and its supporting arms and the receiver members may by reason of the snap fastener means of attachment to the helmet be readily attached to and detached from the helmet 1, the receivers in the attaching and detaching operations being lifted through the apertures in the ear portions 2. By reason of the universal swing joint structure by means of which the transmitter holding structure is supported on the helmet 1 various adjustments of the transmitter to talking and non-talking positions may be readily made by the wearer. The wearer may turn his head from side to side without interference from the head set apparatus and the transmitter may be moved toward the right or left of the center line of the face. The telescopic arrangement of the tubular members 43 within the sleeves 37 also provides facilities through which the transmitter 51 may be moved in a longitudinal line either toward or away from the mouth.

The frictional holding means in the transmitter supporting structure comprising the tubular members 43, the sleeves 37, packing nuts 39 and felt washers 42 and the swing joints including the blocks 31 and 34, the bolts 33, discs 29, and washers 28 together with the spring discs 30 and bolts 27 may be so adjusted that no accidental movement of the transmitter may take place. Movement of the transmitter may readily be made, however, by the wearer and the transmitter when so moved to any desired position will remain in that position until intentionally set to another. After the frictional holding means have been properly adjusted, no further tightening or loosening of these frictional holding means is required. The wearer of the helmet may also by disengaging the snap fastener attachments at any time remove from the helmet all of the communication apparatus and may snap on in place thereof another set without removing the helmet from his head.

What is claimed is:

1. A telephone headset comprising a helmet, ear cap members detachably supported thereon, telephone apparatus including transmitter and receiver members supported by the ear cap members, an adjustable supporting means for the transmitter, said adjustable supporting means comprising a pair of sleeves rotatably supported on the ear cap members, and a pair of arms telescoped within said sleeves.

2. A telephone headset comprising a helmet, ear cap members detachably secured thereto, receiver cover members incorporated in the ear cap members, a transmitter and a pair of receivers, a pair of sleeves adjustably supported by the receiver cover members, a pair of arm members telescoped within the sleeves and adjustably supported

thereby, a connector joining said arm members and supporting the transmitter.

3. A telephone headset comprising a helmet, telephone apparatus including transmitting and receiving devices, ear covering members detachably secured to the helmet, a pair of tubular sleeves adjustably supported on the ear covering members, a pair of tubular arms telescoped within said sleeves, a spring connecting said tubular arms and a transmitter supported on the spring.

4. A telephone headset comprising a helmet, telephone apparatus including transmitting and receiving devices, ear covering members detachably secured to the helmet, a pair of tubular sleeves adjustably supported on the ear covering members, a pair of adjustable tubular arms telescoped within said sleeves, a transmitter supported by said arms, and means within said sleeves engaging said arms to hold the arms in adjusted position.

5. A telephone headset comprising a helmet, telephone apparatus including a transmitter and receivers, ear covering members detachably secured to the helmet, a pair of tubular sleeves, a pair of swing joints adjustably supporting said sleeves on said ear covering members, a pair of tubular arms telescoped within said sleeves, said arms longitudinally adjustable within said sleeves, and compressive means within said sleeves to frictionally hold the arms in adjusted position, said arms supporting the transmitter.

6. A telephone headset comprising a helmet, telephone apparatus including a transmitter and receiver, ear covering members detachably secured to the helmet, a pair of swing joints attached to the ear covering members, a pair of tubular sleeves supported by the swing joints, a pair of tubular arms adjustably held within the sleeves, and a transmitter supported by said arms, each of said swing joints comprising a disc attached to an ear covering member, a plate rotatably supported on said ear covering member and engaging said disc, an eccentrically disposed block on said plate and a sleeve holding member rotatably supported on said block.

In witness whereof, I hereunto subscribe my name this 22 day of January, 1930.

GEORGE R. LUM.