June 28, 1949. J. VOLKMANN 2,474,386

HEADBAND AND EARPHONE MOUNTING

Filed June 19, 1944

Fig. 1.

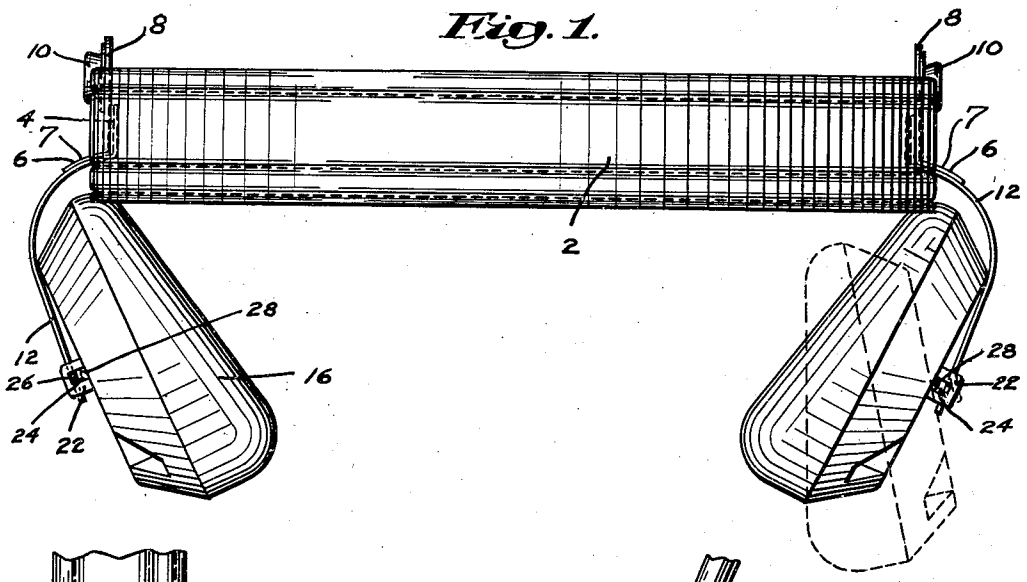


Fig. 2.

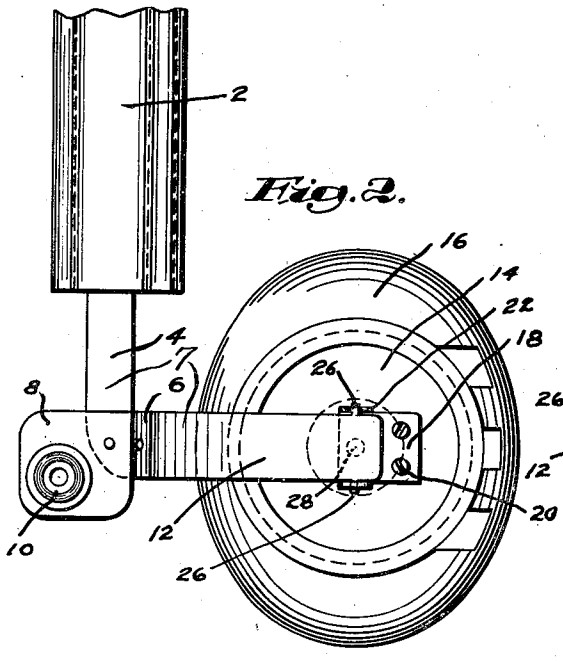
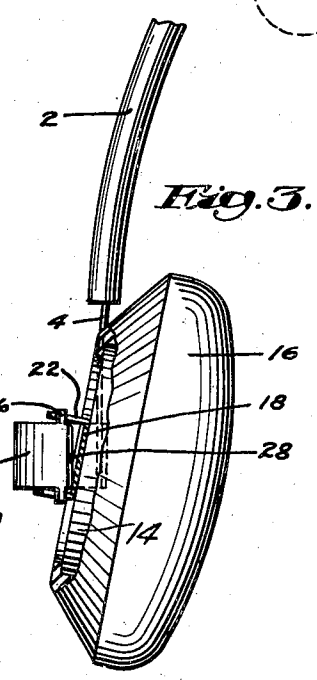


Fig. 3.



Inventor:
John Volkmann
By William D. Hall,
Attorney

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HEADBAND AND EARPHONE MOUNTING

John Volkmann, Cambridge, Mass., assignor to the United States of America as represented by the Secretary of War

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4 Claims. (Cl. 179—156)

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This invention relates to headbands and more especially to a headband for supporting an earphone socket in a position such that it may be worn in conjunction with an army helmet or other headgear.

An object of the invention is to provide an improved headband structure and to devise means for supporting an earphone and earphone socket in a position which permits an army helmet to be worn thereover. Another object of the invention is to provide a device of the character described which will eliminate discomfort and avoid interference with a helmet or other headgear. Another object of the invention is to provide improved adjustment and fitting means for an earphone and earphone socket assembly. The invention also is directed to provide a simple, cheap and efficient headband structure, including novel universal pivot support for the earphone.

The nature of the invention and its objects will be more fully understood from the following description of the drawings and discussion relating thereto.

In the accompanying drawings:

Fig. 1 is a plan view of the headband of the invention;

Fig. 2 is a view in side elevation of the headband structure; and

Fig. 3 is a fragmentary rear elevational view of the headband.

The headband of the invention includes a band member, curved arms of which extend laterally and then rearwardly from the extremities of the headband, and adjustable supporting means for loosely attaching the extremities of the curved arms to earphone members. The adjustable supporting means provide limited freedom of movement which permits earphones and earphone socket members to be quickly and accurately positioned at each side of the head. The curved arms further provide a means of supporting the earphone sockets in a position such that a helmet (not shown) may be worn over these members.

Referring more in detail to the drawings, numeral 2 denotes a headband member, preferably formed of flat spring steel or some other suitable resilient material. The headband is covered with a casing of leather or other substance. Slidably received in the ends of the headband 2 are vertical flat arms 4 of substantially L-shaped adjustment pieces or slides 7 which project downwardly, as may be more clearly observed in Fig. 2. The arms 4 may be moved slidably in and out of the extremities of the headband 2 to provide any desired adjustment of virtual

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length of the band which may be desired. Numeral 6 denotes laterally projecting flanges formed on the arms 4. These flanges extend rearwardly and outwardly for a short distance as disclosed in Fig. 1. Fastened to the bases of the arms 4 are bracket plates 8, on the outer surfaces of which are mounted single elements of snap fasteners 10. The snap fasteners are provided to furnish a means of attaching suspension members for lip microphones and other equipment which may be desired to be held against or in front of the face of an operator.

At the inner surfaces of the flanges 6 are secured horizontal supporting arms 12 which extend laterally and curve rearwardly away from the arms 4, constituting the lower horizontal arms of the L-shaped slides 7. The arms 12 are curved outwardly away from the arms 4 and rearwardly for a short distance and are then straightened so as to form a planiform plate, inclined inwardly in the manner illustrated in Fig. 1. If desired, the arms 4 and the supporting arms 12 may be made in one piece, or other arrangements may be resorted to.

The curved arms 12 are designed to support at their extremities earphones 14 mounted in earphone sockets 16. The earphone sockets 16 are described and claimed in my Patent No. 2,403,418 issued July 2, 1946, and the construction of these earphone sockets forms no part of the present invention. However, it is pointed out that the earphone socket construction is of a character which generally adapts itself to use in conjunction with army helmets by reason of a relatively thin body, carefully designed to just occupy the space between the head and an army helmet at points adjacent to the ear, thus eliminating interference or discomfort.

The laterally extending curved arms 12 afford a compact and efficient means of holding the earphones and earphone socket in a suitable position adjacent to the ears and with the headband itself being positioned at points substantially forward of the ears. As a result, no special space outwardly of the earphones is required to accommodate devices for adjusting the phones vertically, or horizontally, and a helmet member may fit snugly over the earphone sockets without actually contacting them. The means for securing the earphones to the ends of the curved arms 12 includes a flat frame plate member 18, which is solidly secured to the outer flat side of the earphone 14 by screws 20. Projecting horizontally outwardly from the upper and lower edges of the plate 18 there are integral parallel ears 22 having slots 24 formed

therethrough. These slots are of a width to loosely receive and retain vertical coaxial trunnion studs 26 formed integrally on the upper and lower edges of the arm 12 near the extremity of the latter, and the slots are elongated in a direction normal to the plate 18. At the central part of the plate 18 a nodular bearing member 28 is pressed outward from the material of the plate. During the use of the device, these nodules serve as point thrust bearings against which the flat surfaces of the arms 12 may bear and pivot universally while pressing the ear phones to the head of the user. When the head set is removed from the head of the user, the thrust bearing nodule 29 does not function materially, as the arm 12 may be free therefrom entirely when both trunnion lugs are in the outer parts of the slots. The earphones in the latter case may have greater scope of horizontal pivotal movement, enabling more ready initial adjustment of the device on the head.

It may be seen from Figure 1, that the planiform rear portion of each arm 12 is offset from its junction with the head band, and that this offset is approximately the same as the lesser thickness of the head phone and socket piece 16, so that when the device is fitted to the ear, the arm 12 is close to the thinner part of the ear phone unit. This further minimizes the space required for the device within a helmet, and allows free spring action of the headband in which its ends are somewhat sprung apart by the reaction of the arms 12 when the head of a user is interposed. At such times the forward portions of the arms 12 are usually spaced further from the forward parts of the earphone units.

The headband structure permits adjustment of the earphone sockets in several different respects. The length of the headband, and consequently the spacing of the earphone sockets from the top of the headband, may be varied by movement of the arms 4 in the ends of the headband. The headband itself, being of a resilient character, allows the earphone sockets to be moved away from one another along the interaural axis. In this movement the end portions of the headband function as torsion springs at the same time that they press the earphones inward by stress components acting linearly in the major plane of the band; the band ends being slightly separated further from their normal relative free positions. The torsion function of the head band lessens the pressure on the ears of the user which might otherwise be exerted by the full inward force available at the ends of the head band. The loosely held arrangement of the trunnion studs 26 in the slotted ears of the frame plate 18 permits movement of the earphone socket around the axis of the studs through a limited arc of rotation in a horizontal plane passing through the interaural axis. At the same time, the studs on the curved arms are free to move in and out in the slots of the sides 22 with the ends of the arms lying in contact with the round bearings 28, a universal pivot effect being thus attained.

A feature of the movement of the earphone socket as permitted by the structure described is the limited character of the movement, such as is indicated by the dotted line position illustrated in Fig. 1. The earphone sockets are prevented from being rotated through a complete circle or into a position where manipulative adjustment is necessary before placing the headband over the head. The limited arc of rotation in both

vertical and horizontal planes permits sufficient freedom of movement to make satisfactory and accurate adjustment for different size heads, and yet the earphone sockets are constantly held in a substantially ready position.

Another feature of the invention consists in the fact that the arms 12 apply pressure on the point bearings 28 centrally of the earphones themselves. The ends of the arms 4 are also (by reason of the separating movement of the ends of the band) prevented from pressing against the sides of the head when the band is contacted by a helmet or other agency. It is also pointed out that the curved arms 12 extend rearwardly from a distance in front of the interaural axis and incline inwardly toward one another at their rear parts, so that the sockets 16 normally tend to cling to the ears. This gives a more accurate fit and allows the earphone sockets to be quickly located in a correct position over the ears.

It will be seen that I have provided a simple and efficient device for supporting earphone sockets from arms which extend backwardly from a headband, thus presenting a compact arrangement about which a helmet may be easily positioned. Adjustable features are also included which provide for comfort, ease in installation, and various other advantages.

While I have shown a preferred embodiment of my invention, it should be understood that various changes and modifications may be resorted to, in keeping with the spirit of the invention as defined by the appended claims.

1. A headband and earphone mounting comprising a flat steel spring headband of inverted U-shape constructed and shaped to engage over and across the head of a person with its ends planiform and parallel at the sides of the head of, and forwardly of the ears of the person, L-shaped adjustable slides having broad, flat arms, one in a plane with and telescopically engaged with the respective end of the headband, the other arm of the slide being extended laterally outwardly from the plane of the end of the head band and thence rearwardly to form a horizontal planiform earphone support arm broadened in a vertical plane offset from the plane of the adjacent end of the head band and convergent rearwardly theretoward, coaxial vertical stud-like trunnions formed at the upper and lower edges of the earphone support arm, an earphone frame plate member constructed for fixed attachment to the outer side of an earphone, upper and lower parallel ears formed thereon slightly above and below the earphone support arm, and having respective slots therein to receive loosely therethrough respective trunnions, the slots being both elongated in a direction normal to the plane of the plate a distance sufficient for limited sliding movement of the trunnions therein whereby an earphone on the plate may pivot on a horizontal axis through an angle limited by engagement of the trunnions at the ends of said slots, said trunnions being revoluble on their axis in the slots, said offset arm being extended beyond said axis a distance sufficient to limit rocking of a mounted earphone on said trunnion axis as required.

2. An improved article of manufacture, as a combined earphone and microphone support, the structure of claim 1 wherein a planiform forward enlargement is formed at the junction of the arms of the slide, and a separable fastener member thereon.

3. The structure of claim 1 in which an ear-

phone is included having head-fitting cushion elements, the cushion elements being thicker at their rear portions so that when in use the ear phones are inclined in planes convergent forwardly to the planes of the ends of the head band, and the offset of the planiform part of said earphone support arm is substantially the same as the lesser thickness of the earphone and cushion assembly.

4. The structure of claim 1 wherein a nodule is pressed in the said frame plate toward the said support arm, whereby the flat side of the latter may press upon the nodule as a universal pivot thrust bearing.

JOHN VOLKMANN.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
911,178	Sullivan	Feb. 2, 1909
1,452,851	Schmidt	Apr. 24, 1923
1,573,839	Leich	Feb. 23, 1926
1,579,412	Stenberg	Apr. 6, 1926
2,337,953	Wirsching	Dec. 28, 1943

FOREIGN PATENTS

Number	Country	Date
353,758	Germany	May 24, 1922
439,808	Germany	Jan. 19, 1927