

Feb. 18, 1930.

H. KÜCHENMEISTER

1,747,778

HEAD TELEPHONE

Filed Nov. 17, 1926

Fig. 1.

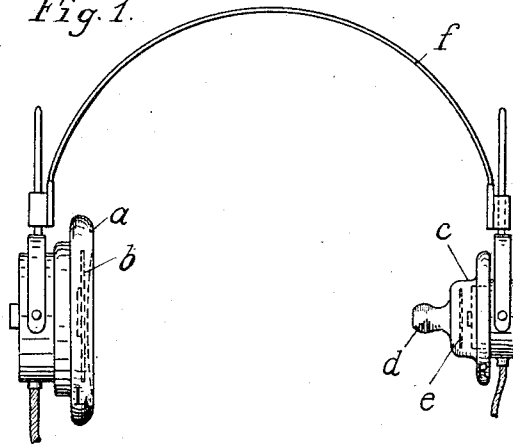


Fig. 2.

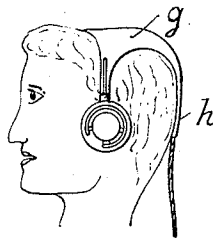


Fig. 3.

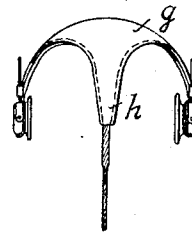


Fig. 4.

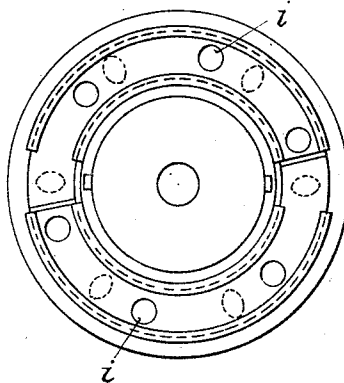
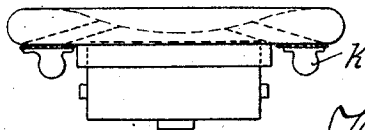


Fig. 5.



Inventor:

Heinrich Küchenmeister
By: *Marks & Clerk*
A-115.

UNITED STATES PATENT OFFICE

HEINRICH KÜCHENMEISTER, OF BERLIN, GERMANY

HEAD TELEPHONE

Application filed November 17, 1926, Serial No. 148,923, and in Germany February 17, 1926.

This invention relates to improvements in the construction of head telephones for radio reception, the main object of the invention being to produce a plastic or stereoscopic sound effect. By "plastic or stereoscopic sound effect," I understand the impression created on the ears that the sound comes from space. The sounds reach the two ears with different higher harmonics and therefore different colouring, so that a person has the impression that the sounds come from a room or from space. It is entirely immaterial what kind of a room it is and where it lies. The main point is that the sounds should produce such an effect, which is referred to herein as a plastic or stereoscopic sound effect. It is known in the artificial reproduction of sound that its plastic effect can be substantially increased by taking into consideration the feeling of direction, the sounds being led with a time lag to the left and to the right ear and/or sound impressions of different tones being produced in the two ears. This approach to the original in the reproduction of sounds is effected according to the invention by constructing the telephone, as regards form and material, differently for the left and right telephone piece.

Another object of the invention is so to construct the improved head telephones that the user shall, nevertheless, be able to hear conversations, etc. that are carried on around him.

Referring to the accompanying drawings which illustrate the invention by way of example, Figure 1 illustrates the improved head telephone in elevation. Figs. 2 and 3 are respectively a side elevation and a rear elevation of the improved head telephone with a different kind of strap; Figs. 4 and 5 illustrate in plan view and elevation respectively one of the ear pieces provided with valve openings and with an adjusting device.

Referring to Figure 1, the left ear piece *a* is made hollow and is provided with an iron diaphragm *b*, while the right ear piece *c* guides the sound in a manner similar to the end piece of a tubular stethoscope to the opening of the ear, by means of a projection *d*, the diaphragm *e* being for instance made of

wood or mica and provided with a small iron piece opposite the magnetic cores of the telephone. In this way it is attained that in consequence of the different natural periodicities of the two ear pieces the one ear receives better the tones of higher frequencies and the other one the tones of lower frequencies.

The user is thus in a position to receive from the proper direction, viz on his right or on his left, the different tones exactly as in the concert hall, according to the actual position of the various parts of the orchestra.

Owing to the two ear pieces *a* and *c* being differently constructed in the arrangement hereinbefore described the necessity arises of providing means which will ensure that the user shall always place the head telephones in the proper position. This is especially important when use is made of a plurality of receiving devices and of separate transmission of different individual groups, which may be retarded with respect to one another, and it is desired to produce a directional feeling. In that case an interchanging of the ear pieces would lead to an unbearable sound distortion.

The differentiation between the right and left ear-cap in addition to being established by the difference in their shapes may otherwise be indicated for instance by a different colouring of/or indication on the ear-caps themselves, the difference being thus established by sight as well as by feeling. Further, for the same purpose the head strap *f* may be formed in the manner of a cap *g* capable of being placed on the head only in one definite position as shown in Figures 2 and 3. Also the fastening or mounting of the two telephones may be used for this purpose. In order to prevent the cords from becoming entangled they are led to the telephones in or in the lower tail piece *h* of the head strap.

In order that the user may be able, in spite of the loud sound produced in the telephone, to listen to other surrounding sounds without taking the telephones off, or in order to listen to communications from other persons, the head telephones constructed according to the invention are provided with slot-like re-

cesses *i* which can be opened or closed, according to requirements, for instance by means of a small valve *k*.

What I claim is:—

5 A head telephone for radio reception and talking machines having a head strap to which the two ear pieces are attached, the said head strap having a tail piece which
10 adapts itself to the shape of the head and having the telephone cords leading to the two ear pieces passing through the rear tail piece of the head strap for the purpose set forth.

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

HEINRICH KÜCHENMEISTER.

20

25

30

35

40

45

50

55

60

65