Oct. 8, 1929. G. B. FRENCH 1,730,761

TELEPHONIC COMMUNICATING MEANS

Filed Sept. 8, 1927

Fig. 1.

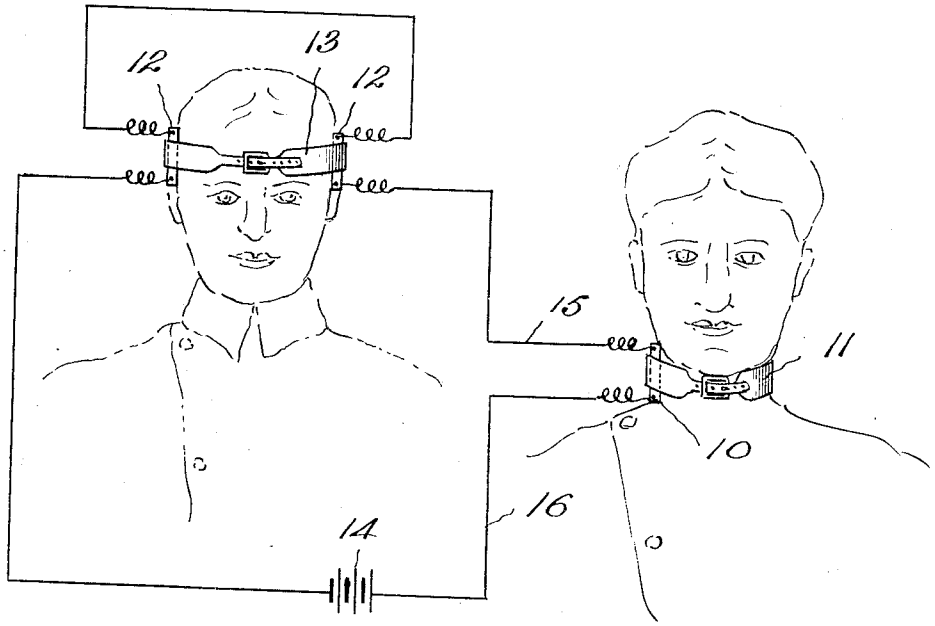
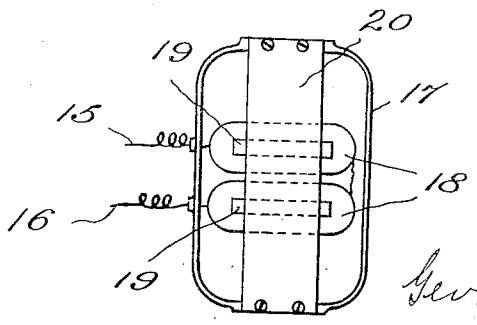


Fig. 2.



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UNITED STATES PATENT OFFICE

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TELEPHONIC COMMUNICATING MEANS

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Owing to the loud noise of the motors driving an aeroplane it is not possible for the pilot and the mechanician or observer to communicate orally in the ordinary manner.

It has accordingly been common practice to supply a telephonic apparatus for such communication. Helmets are used to shut out the motor noise so far as possible, and the transmitter and receiver are placed to the mouth and ear respectively within the helmets.

This arrangement, while making it possible to communicate orally in an aeroplane, has the great disadvantage that the mouth of the speaker is constantly imprisoned, so to speak. This prevents feeding and to some extent obstructs breathing, as well as creating embarrassment in case of coughing, sneezing, etc.

My present invention relates to means whereby telephonic communication may be effectively carried on in spite of great noise, such for instance as that of aeroplane motors, machine shops and the like, while at the same time leaving free the ears, nose, mouth and eyes of both persons in communication.

Where my invention is employed on an aeroplane the customary helmets need not be used. To shut out the din of the motors the ears alone may be simply closed by any appropriate means.

The invention is illustrated in the accompanying drawings wherein Figure 1 is a perspective drawing of two persons furnished with my invention, and Figure 2 is a front elevation of my improved transmitter.

My invention comprises not only a special application of the transmitter and receiver of a telephonic combination, but also covers a novel form of transmitter which is capable of operation when in appropriate contact with a speaker's body but does not respond to ordinary acoustic vibrations in the air. This form of transmitter is therefore, especially adapted to use in my special combination of transmitter and receiver as hereinafter described and claimed.

I have found that a properly constructed transmitter may be successfully operated by simply mounting it in contact with the pulmothoracic region of the speaker, by which I mean the chest or neck, and preferably the latter.

I have also found that if an ordinary telephonic receiver be clamped against the head, preferably against the temple or the mastoid bone, the sound will be transmitted directly to the inner ear. This permits dampening or exclusion of undesirable noises from the outer and middle ear, permitting exclusive reception of the sounds telephonically transmitted.

The specific means for carrying out my invention may take a great variety of forms, and in the drawings I have shown a preferred arrangement wherein any suitable form of transmitter 10 is secured against the throat of the speaker by suitable means, such as a strap 11.

The receiver or receivers 12 is or are secured against the head, as, for instance, the temples, of the person spoken to, by suitable means. In the drawing a strap 13 is used for this purpose.

The usual battery 14 is electrically connected with the transmitter and the receiver or receivers by conductors 15, 16, in a well known manner. Obviously both persons may be equipped with both transmitter and receiver so as to talk back and forth. This merely involves duplication of what is shown in the drawing.

My invention may be carried out by using any well known form of transmitter 10, but, to obtain perfect results, it is best to employ a transmitter which does not respond to aerial sound waves, but is operated directly by the bodily vibrations incident to speech.

Accordingly I have invented a novel transmitter for this purpose a preferred form of which is shown in Figure 2.

My novel transmitter may be described broadly as one which is provided with a diaphragm which is too thick to respond to aerial sound waves, while sensitive enough to operate successfully under the direct influence of the more massive vibrations of a portion of the speaker's body in contact with such diaphragm.

In order the better to exclude all ordinary aerial sound waves, the microphone is dis-

pensed with, and instead my preferred transmitter employs electro-magnetic coils and cores in combination with a relatively massive diaphragm of magnetic material such as soft iron or mild steel.

In order that the diaphragm used may be substantially free from the influence of aerial sound waves, I use a diaphragm of a form which permits free balancing of air pressures on its two sides. For this purpose an elastic strip is substituted for the usual closed round diaphragm.

In Figure 2 the casing of the transmitter is shown at 17. Within this casing are placed the high resistance coils 18 with their cores 19. These coils 18 are connected with the battery 14 and the receiver 12 by the wires 15 and 16.

Over the coils or poles of the cores 19 extends my improved form of diaphragm consisting of a mere strip 20 of vibratory magnetic material, such as mild steel. This is so placed as to come into direct contact with the body of the speaker when secured as shown in Figure 1 at 10. The strip 20 is made thicker than the ordinary telephonic diaphragm both in order to provide a more efficient path for the magnetic lines of force, and to prevent vibration due to external noises transmitted through the air. The free access of air to both sides of the strip 20 also serves to prevent vibration in response to ordinary acoustic waves.

What I claim is—

A telephonic transmitter for attachment to the throat, comprising a relatively thin flat casing, a magnet with a pair of relatively short magnet poles of elongated cross-section mounted centrally of said casing, a pair of elongated circuit coils about the respective magnet poles, and an armature formed from a narrow strip of relatively thick magnetic material having its ends supported on and secured to said casing so as to lie transversely of said magnet poles with its side edges free, the casing being adapted to be attached flat againt the throat with said armature extending longitudinally thereof, said armature being of such thickness as to respond to movements of the throat in articulate speech, but not to respond to air sound waves.

In testimony whereof I hereunto affix my signature.

GEORGE B. FRENCH.