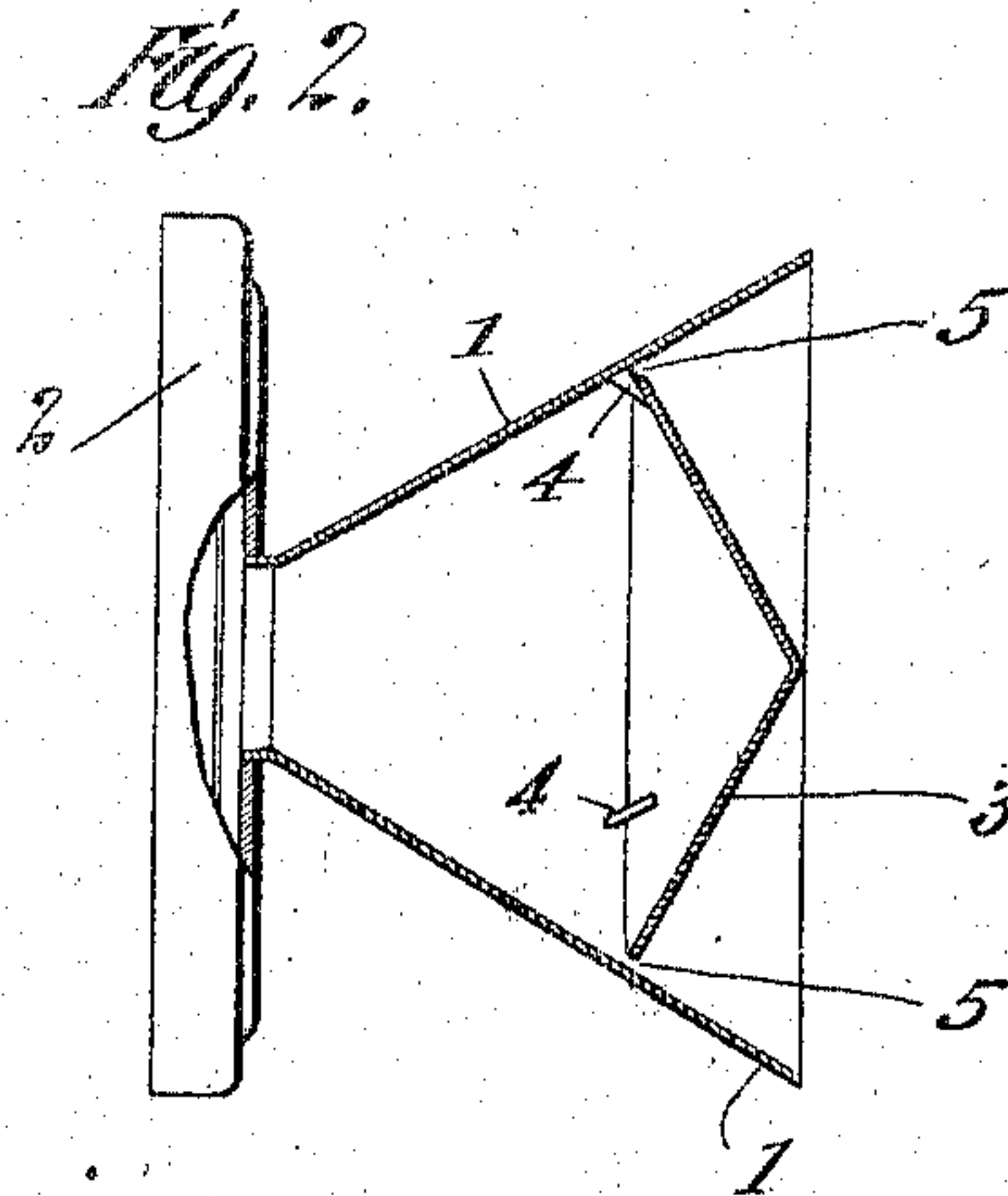
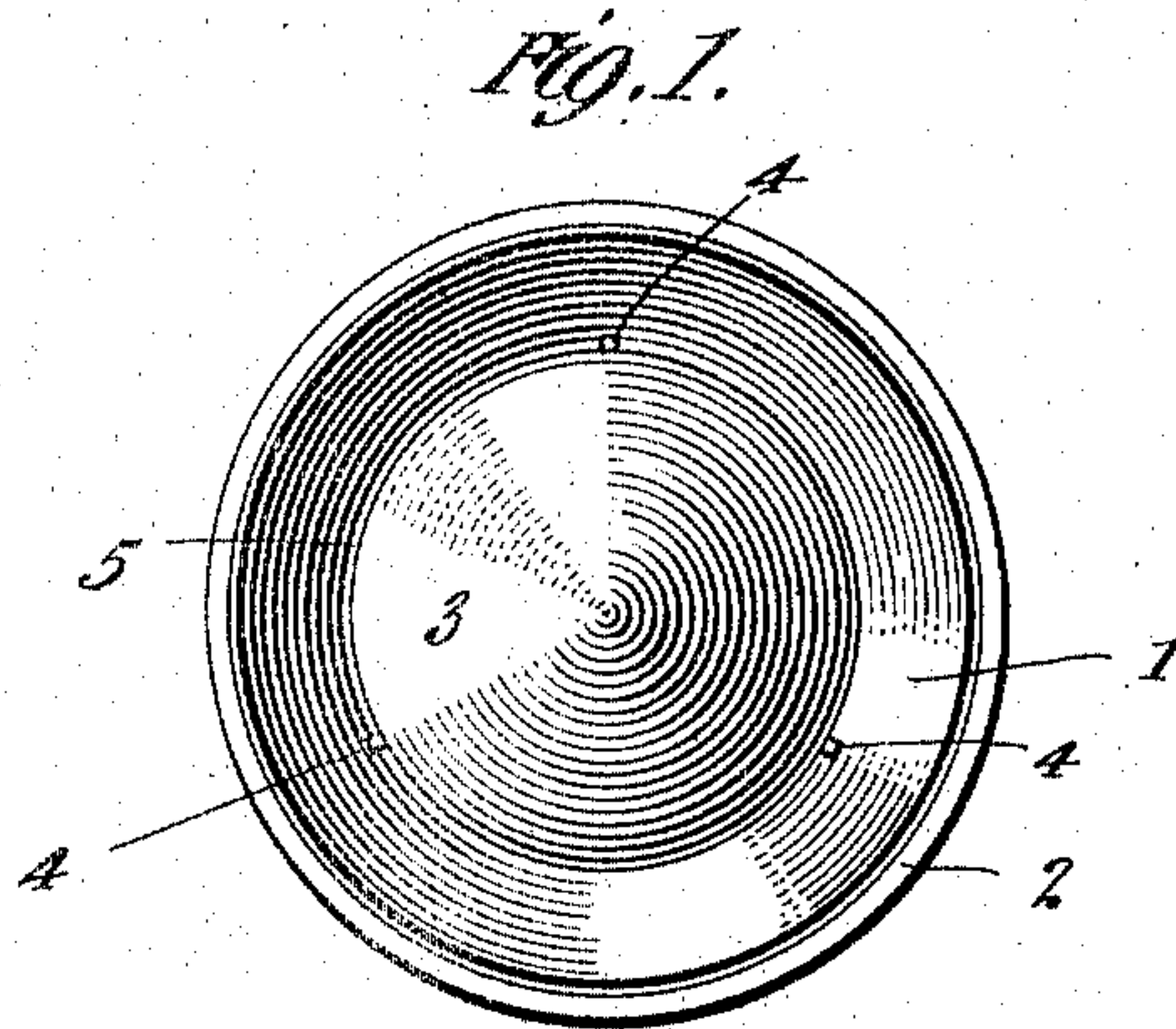


O. F. FALK.
TRANSMITTER MOUTHPIECE.
APPLICATION FILED JULY 13, 1909.

967,747.

Patented Aug. 16, 1910.



Witnesses:
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UNITED STATES PATENT OFFICE.

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TRANSMITTER-MOUTHPIECE.

967,747.

Specification of Letters Patent.

Patented Aug. 16, 1910.

Application filed July 13, 1909. Serial No. 507,319.

To all whom it may concern:

Be it known that I, OSCAR F. FALK, a citizen of the United States, residing at Belleville, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Transmitter-Mouthpieces, of which the following is a full, clear, and exact description.

My invention relates to a novel mouthpiece for telephone transmitters, having a form of construction adapted to produce a purer and louder transmission, or in other words, a more efficient action of the sound delivered into its receiving orifice than is obtained with the present simple conical or tapered passage.

Sound waves or vibrations travel in the manner of an enlarging sphere, and the zone or area of the spherical wave which is projected against the orifice of any mouthpiece is partly concentrated by the use of the usual conical or tapering construction thereof, in order to get an increased force against the diaphragm. Nevertheless this action is not very efficient, the energy being reflected more outward than inward from the walls of the conical passage; moreover the energy is reflected from the diaphragm itself without imparting any large percentage of force thereto. If the waves reflected in this way can be thrown back again in the direction of the diaphragm, a corresponding gain would evidently be secured. A still greater gain might be obtained from a third reflection, and so on.

It is the purpose of my invention to accomplish this result and utilize practically all the energy of the sound wave which enters the telephone transmitter mouthpiece.

With this object in view my invention consists in the features of construction and combination as hereinafter set forth and shown.

In the drawings: Figure 1 is a front elevation of a transmitter mouthpiece embodying the principles of my invention, and Fig. 2 is a vertical sectional view of the same.

Referring to the drawings in which like parts are designated by the same reference sign, 1 designates a conical or otherwise flaring or tapered passage, channel, tube or chamber, which communicates at its small end with the sound inlet orifice of a transmitter casing 2.

3 is a dished reflecting plate fixed at the

mouth of the channel 1 with its convex side outward and its concave side inward. This dished reflecting plate is attached to the walls of the channel 1 in such a way as to provide an even or regular annular space 5 between the two parts, through which sound from outside may enter. For this purpose I provide three connecting spokes or lugs 4, although it is evident that any skeleton supporting means desired may be used. The sound is guided to enter the annular opening by the adjacent inclined surfaces of the channel 1 and the dished reflecting plate 3. Within the transmitter mouthpiece the sound is in a sense trapped, and theoretically at least will impart all its energy to the diaphragm. This is because any sound energy which is reflected in a backward direction from the wall of the channel 1 or from the diaphragm itself, impinges immediately on the interior concave face of the dished reflecting plate 3, and from this surface is again thrown back toward the diaphragm. This result is particularly efficient as the dished reflecting plate resembles a paraboloid in its general form, which as is well known, is most efficient in reflecting sound along a given axis. This phenomenon must be distinguished from resonance in which the sound waves act upon themselves to increase the amplitude of vibration. As I understand the matter, the action is in the nature of giving the diaphragm repeated opportunities to subtract energy from every sound wave by repeatedly causing such sound wave to be reflected back against the diaphragm surface. It is evident that this action can take place equally well for sound waves of all periodicity, so that there is no strong reinforcing of certain notes as is the case with the phenomenon of resonance.

The efficiency of the apparatus depends largely on the fact that the tones of ordinary voice conversation are not very highly pitched so that the time interval between succeeding waves is vastly greater than the successively reflected impulses of a single wave, which merge together in their effect on the diaphragm to produce a single in and out movement corresponding to the nature of the particular wave received. In other words half a dozen or more reflections to each wave may occur within the transmitter mouthpiece and add their effect to produce a single movement of the dia-

phragm, before another wave comes along as determined by the tones of an ordinary voice.

The particular form and proportions of the device may be varied, but I found by actual experiment that those shown in the drawing produce about the best results. In this case the width of the annular passage is exceedingly small in its relation to the area of the dished reflecting plate 3.

What I claim, is:—

A mouthpiece for a telephone transmitter, comprising a channel the sides of which flare evenly and without substantial change of direction outward from a plane closely adjacent to the diaphragm, to the sound receiving end of said channel, a hollow conical

member, diametrically opposite elements in the surface of which form an angle with each other of considerably more than ninety degrees, and means for supporting said member in close proximity to the sound receiving end of said channel, the apex of said conical member being outwardly disposed with respect to the diaphragm and the periphery thereof being spaced from the tapered wall of said channel to afford a narrow annular passage therewith.

In witness whereof, I subscribe my signature, in the presence of two witnesses.

OSCAR F. FALK.

Witnesses:

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