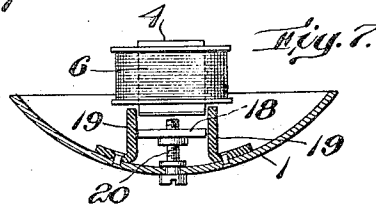
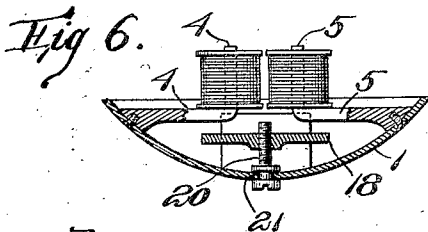
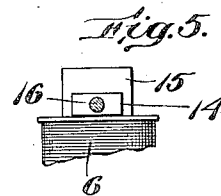
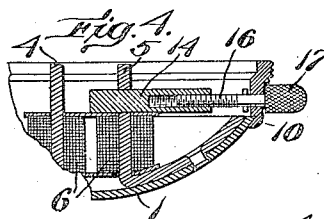
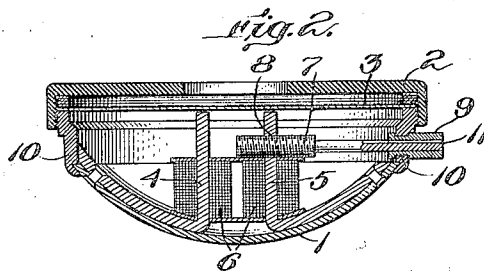
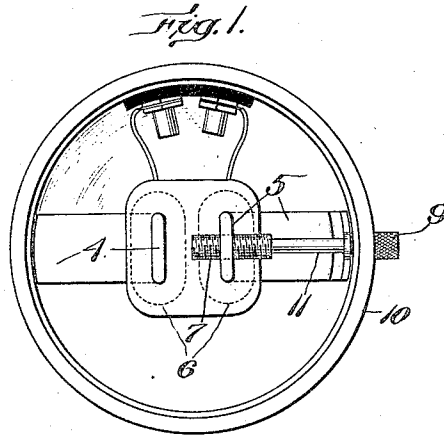


C. E. WILLIAMS.
MAGNETIC REGULATOR FOR AUDIPHONE RECEIVERS.
APPLICATION FILED JAN. 4, 1908.

936,503.

Patented Oct. 12, 1909.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES E. WILLIAMS, OF NATICK, MASSACHUSETTS.

MAGNETIC REGULATOR FOR AUDIPHONE-RECEIVERS.

936,503.

Specification of Letters Patent.

Patented Oct. 12, 1909.

Application filed January 4, 1908. Serial No. 409,265.

To all whom it may concern:

Be it known that I, CHARLES E. WILLIAMS, a citizen of the United States, residing at Natick, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Magnetic Regulators for Audiphone-Receivers, of which the following description, in connection with the accompanying drawings, is a specification, like numerals on the drawings representing like parts.

One deaf person can hear through a receiver more readily than another, and it often happens that the same deaf person will hear more sensitively in the morning than in the afternoon, and likewise the humidity and other conditions of the atmosphere vary the sensitiveness of receivers, which are also subject to a multitude of other influences and conditions which render it advisable to control or regulate the amount of effective lines of force of the electromagnet, and accordingly my present invention consists in providing means externally operable for controlling the amount of effective flux passing through the diaphragm and cores of the electromagnet when energized by a given current, and, believing this to be broadly new, I intend herein to claim the same commensurately.

In the drawings, in which I have shown a preferred embodiment of the invention, Figure 1 is a top plan view of one form of receiver, the cover and diaphragm being omitted to disclose to better advantage my mechanism; Fig. 2 is a sectional view thereof, showing the parts more clearly; Fig. 3 is a cross-sectional detail of the regulating device; Figs. 4 and 5 are views similar to Figs. 2 and 3 of a modified construction; and Figs. 6 and 7 are fragmentary sectional details of a further modification.

The particular form of receiver herein illustrated forms the subject matter of another application, and I therefore omit a description of the details thereof, it being sufficient for the purpose of the present application to mount the electromagnet in any suitable receiver case 1 provided with a cap or cover 2, diaphragm 3 and magnet cores 4, 5, supporting usual spools or windings 6.

The construction thus far described may be of any usual kind in which the windings 6 of the electromagnet provide the requisite magnetic field or lines of force at the upper end of the cores 4, 5, adjacent the diaphragm

3. Accordingly to vary the effectiveness of these lines of force or regulate the flux from one pole or core-end to the other, I provide a soft iron slide or reciprocating device, shown in Figs. 1, 2 and 3 as a screw 7 threaded snugly at 8 in the core 5 in order to prevent any undue air gap or space at the point 8 and in order to afford as complete a closed magnetic path for the flux as possible, said screw being externally operable by any suitable means as, by a milled nut 9 mounted to swivel or turn at 10 in the adjacent wall of the case 1 and made axially hollow at 11 to receive the outer end of the screw 7, which for convenience is grooved at 12 and splined or held by a tongue 13 to the nut. By this simple means the user of the receiver can instantly and at any moment regulate the flux through the cores of the electromagnets at their terminals next to the diaphragm simply by turning the nut 11 one way or the other so as to bring the screw 7 (which constitutes a vinculum or conductor of the lines of force) nearer or farther from the opposite core 4. When this soft iron conductor 7 contacts with the core 4 it forms a practically closed magnetic circuit and hence cuts down the effective lines of force to a minimum, and by moving the magnetic conductor 7 back away from the core 4 more and more lines of force are permitted to influence and to be influenced by the diaphragm. This accomplishes the desired regulation of the audiphone receiver without varying the current in the windings. The conductor 7 is really a magnetic shunt for switching off or drawing away an amount of flux from the magnetic field determined by the space between the front end of the screw or other form of slide 7 and the adjacent core.

In Figs. 4 and 5 I have shown another form of my invention, in which a plate or block 14 is arranged to slide longitudinally in a recess or slot 15 provided through the adjacent core 5, being operated by a screw 16 threaded into said block 14 and having its head 17 projecting externally for convenience in operating the magnetic switch or regulator 14.

In Figs. 6 and 7 I have shown the flux controller or means for regulating the effective lines of force, in the form of a soft iron plate 18 guided between two opposite guides 19 of non-magnetic material and moved bodily in parallelism to itself by a screw 20

swiveled at 21 centrally in the back of the case so that by advancing or retarding the plate 18 the gap between said plate and the adjacent cores 4 and 5 is varied, thereby correspondingly varying the flux substantially in the same manner as more fully described above. It is always desirable that the magnetic regulator shall have as much or more cross-sectional area as the electromagnet pole or core.

I prefer the screw embodiment of the invention, as it is desirable to have one of the screws connected to the regulating device without an air space, as it is well known that an air space kills the efficiency of magnetism, but at the same time I wish it understood that I am not restricted to this embodiment or to any of the specific embodiments of my invention herein shown as the movement of the regulating device need not be even a sliding movement, the idea being simply to provide a variable magnetic path for regulating the flux, and as long as means for accomplishing this purpose is provided I consider it within the spirit and scope of my invention.

Having described my invention, what I claim as new and desire to secure by Letters Patent, is,

1. An audiphone receiver, having an electromagnet and a diaphragm, combined with magnetic means for establishing a shunt

path in the magnetic field for the lines of force of said electromagnet, and means for moving said magnetic means transversely of the electromagnet.

2. An audiphone receiver, having an electromagnet, a cooperating diaphragm, a soft iron conductor adjacent the cores of the magnet, and external operating means to move said conductor toward and from said cores.

3. An audiphone receiver, having an electromagnet, a cooperating diaphragm, a soft iron screw threaded through one core of the electromagnet, and means for advancing said screw toward and from the other core of the electromagnet.

4. An audiphone receiver, having an electromagnet, a cooperating diaphragm, a soft iron magnetic conductor movably mounted in contact with one of the cores of said magnet adjacent the under side of said diaphragm, and external means for moving said conductor toward and from the other core of the electromagnet.

In testimony whereof, I have signed my name to this specification, in the presence of two subscribing witnesses.

CHARLES E. WILLIAMS.

Witnesses:

M. J. SPALDING,
WILLIAM J. PIKE.