

June 16, 1925

1,542,746

J. S. TIMMONS

TELEPHONE INSTRUMENT

Filed June 28, 1921

2 Sheets-Sheet 1

Fig. 4.

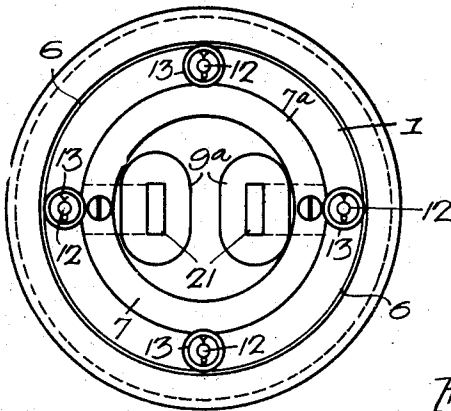


Fig. 2.

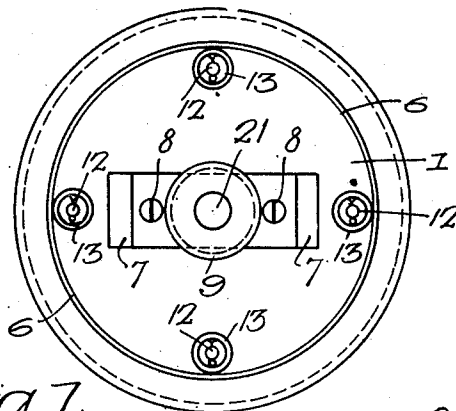


Fig. 1.

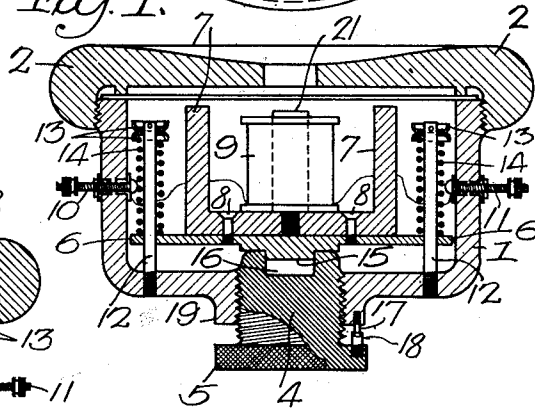
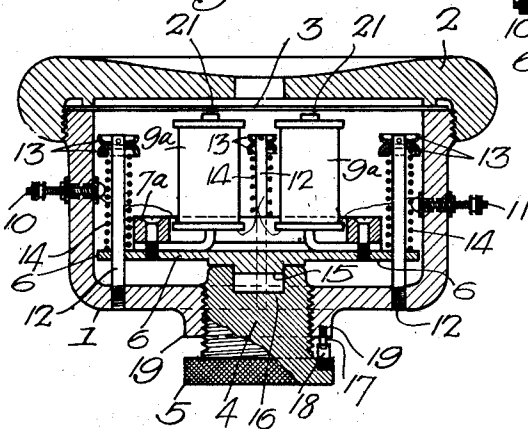


Fig. 3.



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Fig. 6.

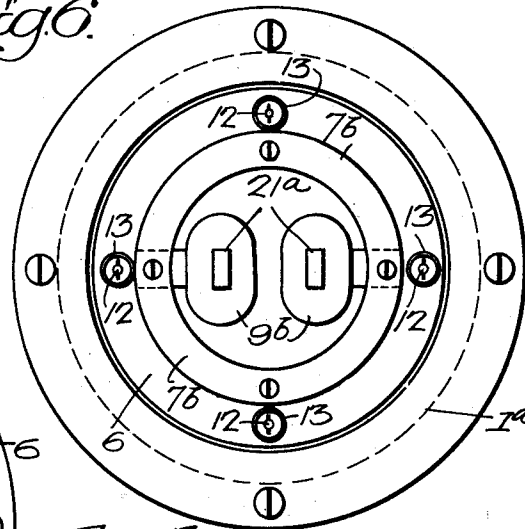


Fig. 8.

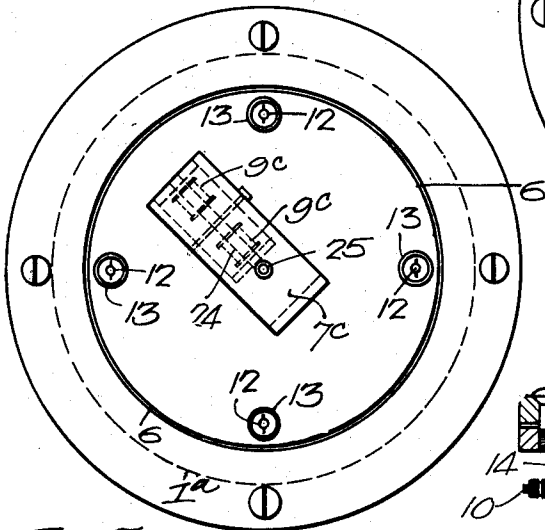


Fig. 5.

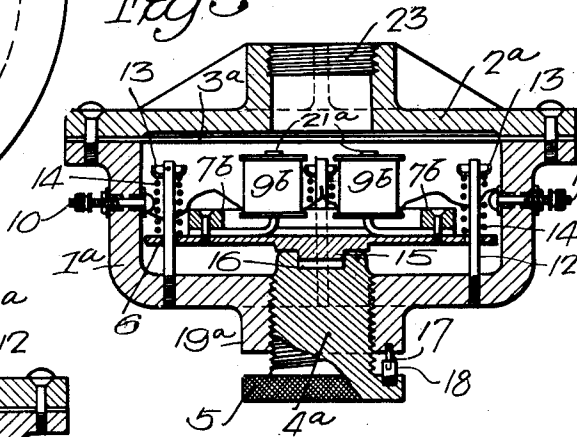


Fig. 7.

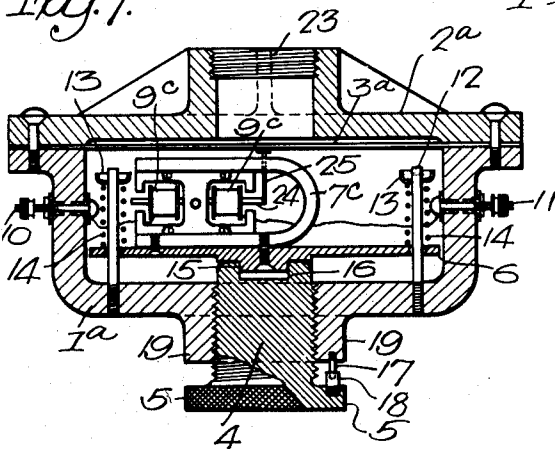
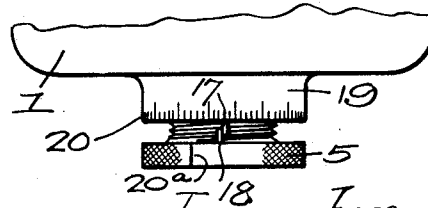


Fig. 9.



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UNITED STATES PATENT OFFICE.

JOHN S. TIMMONS, OF PHILADELPHIA, PENNSYLVANIA.

TELEPHONE INSTRUMENT.

Application filed June 28, 1921. Serial No. 431,040.

To all whom it may concern:

Be it known that I, JOHN S. TIMMONS, a citizen of the United States, residing in Philadelphia, Pennsylvania, have invented
5 Telephone Instruments, of which the following is a specification.

One object of this invention is to provide relatively simple and substantial means for
10 adjusting a telephone transmitter or receiver to change the tone and pitch of the instrument or for the purpose of causing it to operate at the highest efficiency.

A further object of the invention is to provide a telephone instrument with means
15 whereby the above adjustment may be made under operating conditions and from the outside of said instrument.

These objects and other advantageous ends I attain as hereinafter set forth, reference
20 being had to the accompanying drawings, in which,

Fig. 1 is a vertical section of a telephone receiver of the watch case type, illustrating
25 it as constructed in accordance with my invention;

Fig. 2 is a plan of the instrument shown in Fig. 1, the cap and diaphragm being removed;

Fig. 3 is a vertical section of a second form of watch case receiver, also showing
30 it as equipped with my invention;

Fig. 4 is a plan of the interior of the instrument shown in Fig. 3;

Figs. 5 and 6 are a vertical section and
35 a plan of the interior of a receiver of a loud speaking type, equipped with my invention;

Figs. 7 and 8 are respectively a vertical section and a plan of another form of loud
40 speaking receiver, also provided with my invention; and

Fig. 9 is a fragmentary side elevation of a telephone instrument, illustrating the stop
45 for the adjustable plug and the graduations for indicating the amount of its adjustment.

Referring to Figs. 1 and 2 of the above drawings, 1 represents the casing of a watch case receiver which is closed at one end and has threaded on the opposite end a cap 2,
50 clamping to it a diaphragm 3. In accordance with my invention I adjustably thread into the closed end of the case a plug 4 having a knurled head or flange 5 and having its inner end recessed for the reception of
55 the central cylindrical portion or boss of a

plate 6, which in the present instance is circular in outline. This plate carries the magnet 7 of the instrument, which is held to it by screws 8 and on the central pole of said magnet is mounted the receiver coil
60 9 connected to terminals 10 and 11 mounted in the present instance in opposite sides of the case 1.

A series of studs 12, in the present instance four in number, is mounted in and
65 extends parallel with the axis of the case 1, passing through suitable openings in the plate 6, which is thereby held from rotating. Each of said studs 12 has mounted on its
70 inner end a cap or head in the form of a pair of cupped washers 13, between which and the plate 6 is mounted a coil spring 14 tending to force said plate away from the diaphragm and retain it in engagement with
75 the plug 4.

When it is desired to adjust the mechanism of the instrument, in the present instance to vary the air gap between the diaphragm 3 and the poles of the magnet 7, the rotation of the plug 4 by means of its
80 head 5 will bodily move the plate 6 and with it said magnet and the coil 9 toward or from the diaphragm, and obviously this adjustment may be accomplished during operation of the receiver and without interfering with its proper functioning. Screwing
85 the plug 4 into the case will move the pole pieces and coil nearer the diaphragm against the action of the springs 14, while an opposite movement of said plug will permit
90 said springs to cause the plate 6 to slide on the studs 12 and to so move the magnets away from the diaphragm.

The central projection 15 of the plate serves to center this in the depression 16 of
95 the plug and the studs not only prevent rotation of the plate, but insure that it shall at all times remain parallel with the diaphragm without possibility of tilting.

The various parts are so designed and arranged that one complete revolution of
100 the plug 4 will constitute the desirable range of adjustment and in order to prevent further and undesirable movement of said plug I mount on it a stop 17, in such position as to cooperate with the projection
105 18 on the flange 5 of the plug. I preferably form the case 1 with a projecting boss 19 concentric with the plug 4 and graduate it with a scale 20 as indicated in Fig. 9. An
110

index mark 20^a is also preferably formed on the edge of the flange 5 to cooperate with this scale in indicating the adjustment of the diaphragm.

5 In Figs. 3 and 4 I have shown my invention as applied to a watch case receiver of different construction from that of Figs. 1 and 2, the magnet 7^a in this instance being ring shaped in form and having two
10 L-shaped pole pieces 21, on whose parallel arms are mounted the coils 9^a of the instrument. As before, the magnet and coils are carried upon a plate 6 which in turn is acted upon by a series of springs 14 mounted on
15 studs 12 and fixed on the bottom of the instrument. Said plate is carried on the adjustable plug 4 as previously described.

In Figs. 5 to 8 inclusive, I have illustrated my invention as applied to two forms of
20 loud speaking telephone receivers which in each instance comprise a case 1^a and a cap 2^a, having an opening 23 for the reception of a horn. The diaphragm 3^a as before is clamped between the cap and the case and, in
25 the construction shown in Figs. 5 and 6, is acted on by a pair of coils 9^b carried on two L-shaped pole pieces 21^a associated with the circular magnet 7^b. Said coils and magnet, as in the other forms of my invention, are
30 mounted upon a plate 6 carried on studs 12 and pressed toward the closed end of the case by coil springs 14 mounted on said studs. Said plate 6 is rotatably engaged by a plug 4^a adjustably threaded through a boss
35 19^a at the center of the closed end of the case, so that as before the rotation of this plug will vary the distance between the pole pieces of the magnet and the diaphragm 3^a.

In Figs. 7 and 8 I have shown my invention as applied to a second form of loud
40 speaking receiver, in which there is provided a magnet 7^c of the horse-shoe type, carried by and fixed to a plate 6 adjustable within the case 1^a as previously described. This
45 magnet has pivotally mounted within it an armature 24 on which are carried the coils 9^c and one end of said armature is movable between the poles of said magnet while the other is connected through a link 25 with the
50 diaphragm 3^a. If desired the boss 19 may be graduated as before described and also provided with a stop 17 mounted to coact with a projection 18 on the plug to limit the rotation of the latter. In this latter case the
55 adjustment of the plug in the case will as before vary the adjustment of the instrument

as the distance of the armature from the poles of the magnet is varied.

In all of the above constructions the adjustment may be accomplished from the 60 outside of the instrument and that without exposing its interior or permitting access to its electromagnetic elements.

I claim:

1. The combination in a telephone instru- 65
ment of a case; a diaphragm; an electromagnet operatively associated with said diaphragm; a plate carrying said magnet; a plug threaded into the case and engaging the plate, said plug constituting a bearing 70
for said plate; and springs acting on the plate to force it away from the diaphragm.

2. The combination in a telephone receiver of a case closed at one end and having a cap at the opposite end; a diaphragm clamped 75
between the cap and the open end of the case; an electromagnet operatively associated with the diaphragm; a plate carrying said magnet; a headed plug threaded into the closed end of the case and engaging the 80
plate; means acting on the plate for maintaining it in engagement with the plug in such manner as to provide a centering bearing therefor; and a stop for limiting rotation of the plug. 85

3. The combination in a telephone receiver of a case closed at one end and having a cap at the opposite end; a diaphragm clamped between the cap and the open end of the case; an electromagnet operatively 90
associated with the diaphragm; a plate carrying said magnet; a headed plug threaded into the closed end of the case and engaging the plate, said plate having a centering boss, said plug having a recess adapted to re- 95
volubly receive said boss; means acting on the plate for retaining said boss in said recess; and a stop for limiting rotation of the plug.

4. The combination in a telephone instru- 100
ment of a case; studs fixed to and extending within said case; a plate slidable on the studs; telephonic mechanism on the plate; springs respectively mounted on the studs and acting to move the plate in one direc- 105
tion; and a longitudinally adjustable plug threaded into the case and formed at its inner end to receive a centering boss extending from said plate, whereby the plate may be moved against the force of the springs.

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