

No. 762,820.

PATENTED JUNE 14, 1904.

E. GUNDLACH.
ELECTRIC TELEPHONE.
APPLICATION FILED FEB. 5, 1904.

NO MODEL.

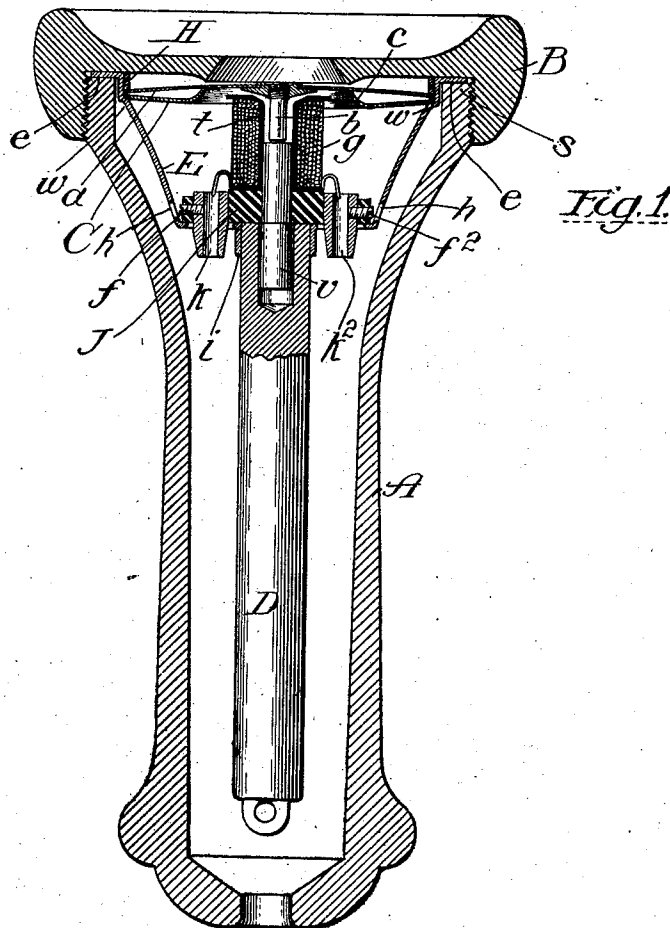


Fig. 2.

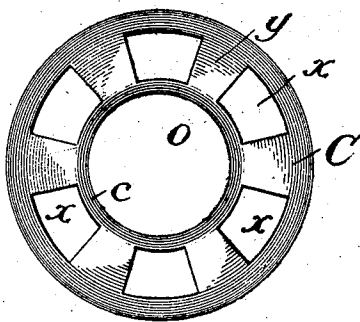
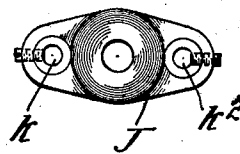


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

ERNST GUNDLACH, OF BERWYN, ILLINOIS, ASSIGNOR TO AMERICAN TELEPHONE & TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

ELECTRIC TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 762,820, dated June 14, 1904.

Application filed February 5, 1904. Serial No. 192,159. (No model.)

To all whom it may concern:

Be it known that I, ERNST GUNDLACH, a citizen of the United States, residing at Berwyn, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electric Telephones, of which the following is a clear, full, concise, and exact description.

In Patent No. 751,501, dated February 9, 1904, I have shown and described means for increasing the efficiency or improving the operation of a telephone by reducing the strain exerted upon the diaphragm by the magnet and substituting therefor mechanical pressure brought to bear upon said diaphragm in a circle or line of substantially circular form between the center and periphery thereof or substantially concentric with said periphery. In the said application for patent I have broadly claimed a telephone embracing this improvement and have also claimed a specific form thereof covering an arrangement in which the mechanical pressure is exerted upon the outer or forward side or surface of the diaphragm. I find that equally good or even better results are obtained with an arrangement by which the mechanical pressure is brought to bear upon the inner or rear side of the diaphragm in a circle or approximate circle, as above described.

In the drawings which accompany and illustrate this specification, Figure 1 is a sectional elevation of a magneto-telephone containing the invention. Fig. 2 is a face view of a circular or annular spring whereby the required mechanical pressure may be applied, and Fig. 3 is an end view of a non-conducting support for the terminal connections of the electromagnetic coil.

In the drawings, A is the ordinary casing of hard rubber or similar suitable material. D is the permanent magnet; *v*, the soft-iron pole-piece thereof; *g*, the electromagnetic coil wound, as usual, on a spool *t*, secured upon and surrounding the front end of the pole-piece; *a*, the diaphragm made of iron or steel, and B the cap or earpiece.

C is an elastic pressure device, preferably as shown in Fig. 2, in the form of a circular

or annular tension-spring having an inner circular edge *c* projecting outwardly from its flat surface concentric with the outer edge and about half-way between the said outer edge and center. This annular spring is mounted behind or at the inner side of the vibratory diaphragm, and when the cap B is screwed or otherwise secured in place the inner edge *c* rests against and presses upon the inner or rearward side or surface of the vibratory diaphragm in a circle or zone between the center and periphery thereof. By means of the said pressure device the diaphragm is mechanically strained or held in tension as described in my before-mentioned application for patent; but the pressure exercised upon the diaphragm *a*, and consequently the mechanically-produced strain, is in a direction opposite to the pull of the magnet.

The soft-iron pole-piece *v* of the magnet is secured to the forward end thereof in any suitable manner and projects into the bore of the spool *t* to a point just beyond the middle of the coil, and a small and light soft-iron core or pole-piece *b*, of a size to fit quite loosely in the bore of the spool, is attached magnetically by an iron screw or otherwise to the center of the vibratory diaphragm and extends therefrom into the spool-bore until it nearly touches the magnet pole-piece.

E is a conical metal cup or open-work cone having a sleeve *i* at its apex, which surrounds and is soldered or otherwise secured to the front end of the magnet D and provided with a flange *e* at its base, resting upon the shoulder *s* of the forward and larger end of the casing and secured by the cap-piece when the same is screwed into position. The circular or annular spring C is mounted within and close to the forward end of the metal cup E, and its outer edge lies upon and is supported in a seat *w*, formed by the narrowing area of the cone, which seat may be a shoulder arranged for the purpose immediately within the flare of said cone. I prefer to make the circular spring device of hard rolled steel and to lighten it by making the apertures *x* in the flat portion *y* thereof between the peripheral

edge and the outwardly-projecting inner circular edge *c*. The vibratory diaphragm *a*, arranged outside of said circular spring device, rests upon the inner circular edge *c* of said device, its small soft-iron core *b* passing through the central opening *o* within said edge and into the bore of the coil *g*. Before the cap B is screwed on the casing the opposite peripheral edges of the circular pressure device and the said vibratory diaphragm are separated by a distance equal to the height of the inner circular edge *c*.

H is a brass ring which fits within the flare of the metal cup E and rests upon the edge of the diaphragm *a*. When now the said cap B is screwed into place, it presses upon said ring, which in turn presses upon the edge of the diaphragm and forces said edge close to the outer edge of the pressure device C, thus increasing the pressure exercised upon the inner or rear side of the diaphragm *a* between its center and periphery by the inner circular edge of said pressure device, and thereby mechanically imparting to the said diaphragm the requisite state of tension.

It will be seen that the entire system of metallic working parts is sustained by the metal cup or cone E and that this in turn is supported by the shoulder of the forward end of the casing and is held in place by the clamping action of the cover or cap.

J is a non-conducting block or support centrally perforated to clasp the soft-iron pole-piece *v* of the magnet D and secured within the narrow portion of the metal cup E between the forward end of the said magnet and the spool *t*. It carries at its two ends connection terminals *k* *k*², to which the two ends of the coil-wire are respectively united, the said terminals in this instance being shown as sockets within which the tips of a flexible

conductor or the ends of wires to connect with the external circuit may be placed and secured by the binding-screws *f* *f*², which are accessible through holes *h*, provided for the purpose and arranged opposite the heads of said screws in the wall of the metal cap E.

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

1. In an electric telephone, the combination with the diaphragm, magnet and coil, of an elastic pressure device mounted behind the diaphragm and constantly exerting pressure upon the inner or rearward side or surface of said diaphragm, in a circle or zone, between the center and periphery thereof, thereby tensioning the diaphragm; substantially as set forth.

2. In an electric telephone, the combination with the diaphragm, magnet and coil, of a circular or annular spring mounted behind said diaphragm and constantly exerting pressure thereon in a circle between the center and periphery thereof, and in a direction opposite to the pull of the magnet, thereby tensioning the diaphragm.

3. In an electric telephone, the combination with the vibratory diaphragm, of a circular or annular spring mounted behind the said diaphragm and constantly exerting pressure against the diaphragm in a circle between its center and periphery, thereby tensioning the diaphragm.

In witness whereof I, ERNST GUNDLACH, hereunto subscribe my name this 1st day of February, A. D. 1904.

ERNST GUNDLACH.

Witnesses:

LOUIS P. WALTERS,
THOMAS D. LOCKWOOD.