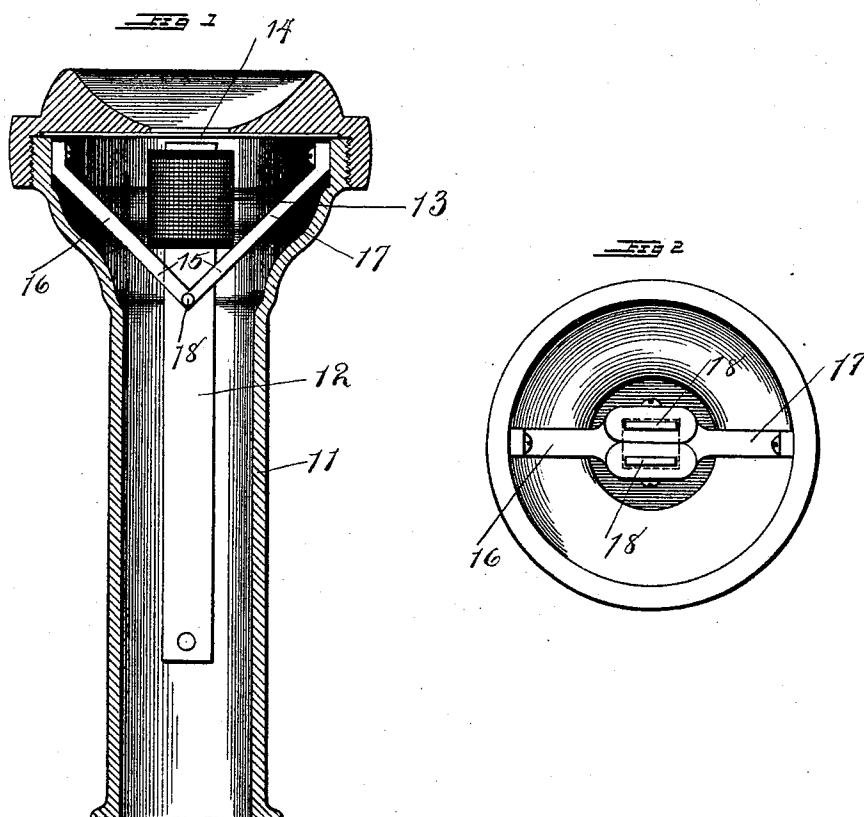


(No Model)

C. F. DUNDERDALE.  
TELEPHONE.

No. 582,522.

Patented May 11, 1897.



Witnesses:  
C. H. Graham  
J. B. Keir.

Inventor  
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Atty.

# UNITED STATES PATENT OFFICE.

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## TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 582,522, dated May 11, 1897.

Application filed June 17, 1895. Serial No. 553,067. (No model.)

*To all whom it may concern:*

Be it known that I, CLEAVELAND F. DUNDERDALE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Telephones, of which the following is a specification.

My invention has for its object to provide means for compensating the changes in position of the parts of a telephone-receiver occasioned by changes in temperature.

My invention has certain other objects in view; and it consists in certain features about to be described, and pointed out in my claim, reference being now had to the accompanying drawings, in which—

Figure 1 is a longitudinal section of a receiver, showing my improved compensating device. Fig. 2 is an end view of the receiver, the mouthpiece and diaphragm being removed.

The casing of the receiver, which is of the usual form, is designated at 10, and has disposed therein the magnet or magnets 12, upon the end of which is mounted the helix 13, which helix is located and held opposite to the center of the diaphragm 14. Secured to the interior of the casing 10, below the diaphragm 14, is the angular-shaped supporting-bridge 15, which may be said to consist of the two arms 16 and 17. These two arms converging toward each other meet at the point 18, and the magnet or magnets 12 are secured to the supporting-bridge 15 at this point 18. The supporting-bridge therefore holds the magnet 12 in proper position relative to the diaphragm 14.

It is a well-known fact that different materials expand and contract in different ratios from changes in temperature. When the magnets of the receiver opposed to the diaphragm are secured to the smaller end of the receiver-casing, as is usually the case, the expansion and contraction of the magnets are both in the same direction, but in different ratios. The hard-rubber shell supporting the diaphragm expands and contracts in a greater ratio than the steel of the magnet 12 and its extension-piece 19, thus varying the distance between the end of the extension-piece 19 and the diaphragm 14 and changing the adjustment.

In carrying out my invention I adjust the length of arms 16 and 17 of the angular-

shaped bridge 15 to the length of the magnet extension-piece 19 in such a ratio as that the expansion or contraction of the arms 16 and 17 and said extension-piece 19 in opposite directions neutralize one another, and thereby maintains constantly the extension-piece 19 at a given distance from the magnet. In other words, the expansion of the arms 16 and 17 of the angular bridge 15, carrying with it the extension-piece 19 at its point of juncture with the said bridge, is compensated by the expansion of the extension-piece 19 in an opposite direction, thus preserving said extension-piece constantly at a given distance from the diaphragm notwithstanding changes in temperature. This desired result is obtained by the attachment of the angular supporting-bridge 15 rigidly to the sides of the casing and providing a point 18, which is free to move in either direction when expansion or contraction occurs, the extension-piece 19 always moving in a direction contrary to that of the support in an equal degree, thus retaining the end of the extension-piece at the same distance from the diaphragm irrespective of the movements of the other parts of receiver.

It will be further noticed that the hard-rubber shell of the casing 10 is left free to expand or contract from its point of jointure with the bridge-support and without effecting the position of the extension-piece relative to the diaphragm.

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

In a telephone-receiver a temperature-compensating device consisting of a bent bridge secured to the receiver-casing at each of its sides and supporting the magnet or magnets, the extension-piece of said magnet being secured to the bridge at that end thereof remote from the diaphragm whereby the bent portions of the bridge are adapted to expand or contract in one direction and the extension-piece in the other and preserve constant the distance between the end of the extension-piece and the diaphragm.

In testimony whereof I affix my signature in presence of two witnesses.

CLEAVELAND F. DUNDERDALE.

Witnesses:

CHAS. C. BULKLEY,  
W. T. TOMPKINS.