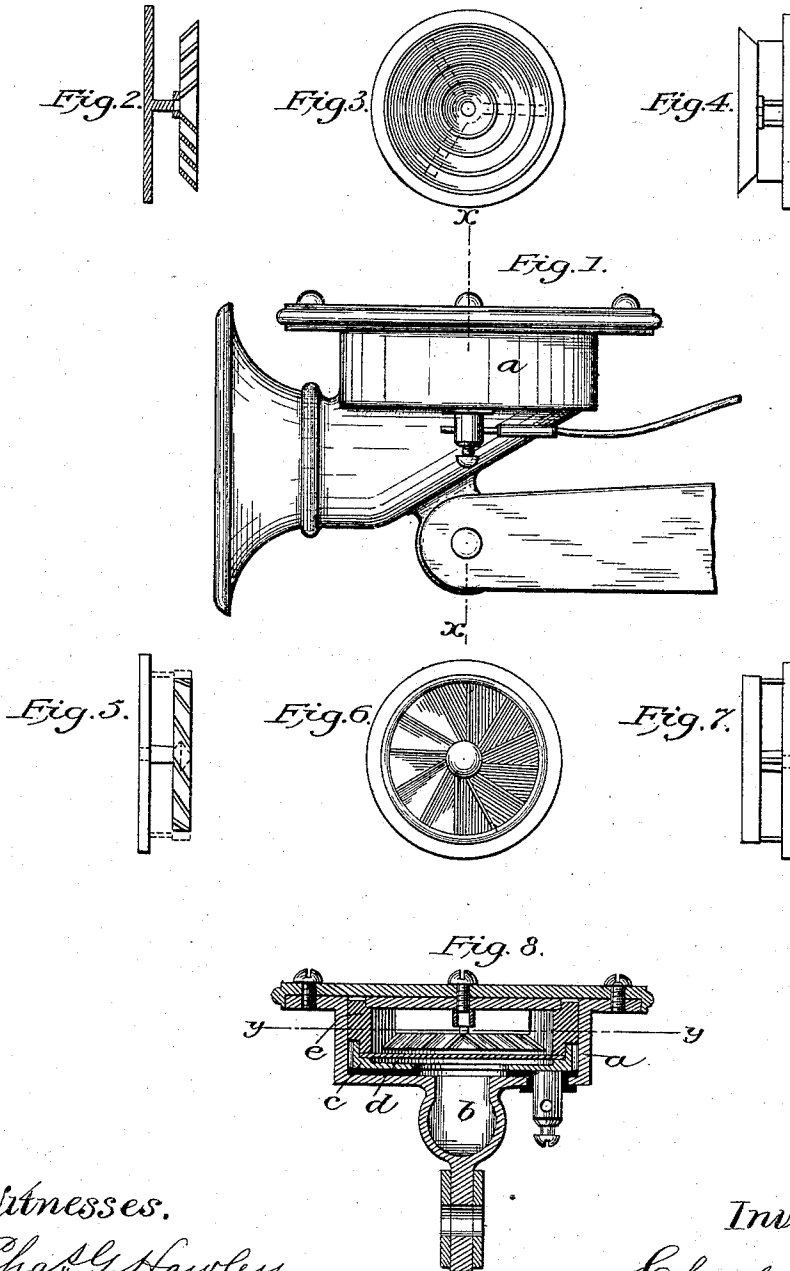


(No Model.)

C. E. SCRIBNER.  
TELEPHONE.

No. 489,990.

Patented Jan. 17, 1893.



Witnesses.  
Charles G. Hawley.  
Albert A. Parker

Inventor.  
Charles E. Scribner  
By George P. Barton  
Attorney.

# UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN  
ELECTRIC COMPANY, OF SAME PLACE.

## TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 489,990, dated January 17, 1893.

Application filed June 1, 1888. Serial No. 275,758. (No model.)

*To all whom it may concern:*

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Electrodes for Long-Distance-Telephone Transmitters, (Case No. 165,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawings, forming a part of this specification.

My invention relates to telephone transmitters in which the variable resistance medium is composed of carbon in the form of granules. In these transmitters in order that the electrical resistance of the mass of carbon may be varied, a disk or electrode has been provided above the diaphragm so that on the vibration of the diaphragm the carbon between the diaphragm and the disk or impact plate will be compressed. This impact plate usually presented a flat surface to the carbon beneath the same. In some instances, however, this surface has been made irregular or corrugated. A sieve or screen has, in some instances, been substituted for the disk so that the carbon would be forced through the sieve to a certain extent upon the vibration of the diaphragm. The design of roughening the surface as well as that of substituting the sieve for the closed impact surface has been to prevent the carbon from becoming packed. Various other attempts have been heretofore made in carbon transmitters of this class to prevent the carbon from packing.

As illustrative of the art, reference is made to Letters Patent No. 380,752, granted Isaiah H. Farnham, April 10, 1888. As described in said patent, the case or cup is provided with an elastic or extensible bottom and means for adjusting said floor or bottom by expanding and raising its center so as to diminish the carbon holding space, thus pressing the carbon therein up against the upper surface of the diaphragm. The efforts, however, heretofore made in the direction of preventing packing have been thus far unsatisfactory and insufficient to accomplish the ends desired. Not only the tremor or vibration of the building in which the telephone may be placed, but also the vibrations caused by the

voice of the user soon cause the carbon to become packed, as it is termed, in such manner as to make the instrument wholly or partially inoperative. In case the screen or sieve is substituted, it is found that there is not sufficient compression of the carbon. The experienced user soon learns the cause, and, as is natural, will begin striking violently against the instrument, and this is the practical mode now in use of stirring up the carbon.

In carrying out my invention as hereinafter described I have so shaped the disk electrode, which is suspended in the mass of carbon above the diaphragm, that the vibrations caused by the voice when thrown against the diaphragm will serve to produce a gentle yet continuous and certain motion or circulation of the granules of carbon among themselves. The packing of the carbon is thus entirely prevented by any action of the voice upon the diaphragm, and in case the carbon shall have become packed by the vibration of the building or otherwise, the first vibration of the diaphragm would be sufficient to unpack it when my form of disk or electrode is employed.

My invention consists, essentially, in providing deflecting surfaces placed at such an angle or at such angles with respect to the diaphragm below as to afford sufficient impact surfaces so that the carbon will be properly compressed to change or vary its resistance in response to the vibrations of the diaphragm, yet so arranged that the particles of carbon striking against these surfaces will be deflected and caused to circulate, thus serving to avoid that condition of the carbon particles which is technically known as packing.

My invention is illustrated in the accompanying drawings, in which

Figure 1 is a side elevation of a telephone transmitter embodying my invention. Fig. 2 is a sectional view illustrative of the suspended disk or electrode provided with the preferable form of deflecting impact surfaces. Fig. 3 is a view from below of the same. Fig. 4 is a side elevation thereof. Fig. 5 is a sectional view of modification of the suspended disk or electrode. Fig. 6 is a view from below of the same. Fig. 7 is a side elevation thereof. Fig. 8 is a transverse vertical central section

of the telephone upon line *xx* of Fig. 1, the special form of disk or electrode shown in Fig. 8 being the form which is illustrated in detail in Figs. 2, 3 and 4.

5 I will first describe my invention as illustrated in Figs. 1 and 8. The case *a* is a casting cup shaped and provided with a chamber *b* into which the user speaks. The cup proper *c* is placed in this case in the usual  
10 manner and insulated therefrom. The diaphragm *d* is placed in contact with the seat provided therefor above the inner edges of the cup, as shown. The cup *c* is provided in the usual manner with the opening at its  
15 center below the diaphragm. The ring *e* of insulating material is placed in the case in the usual manner, as shown, resting upon the outer edge of the diaphragm and upon the upper edge of the cup *c*. This ring *e* is pro-  
20 vided with a groove or shoulder which forms a seat for the disk or electrode, the deflecting impact surfaces in this instance being funnel shaped and in the form of concentric rings, as seen more clearly in Figs. 2, and 3.  
25 The granulated carbon for clearness I have not shown. There should be sufficient to a little more than cover the rings. The dotted line *yy* may be considered as indicating the upper surface of the carbon. It is evident  
30 that on the vibration of the diaphragm *b* the carbon will be forced against the deflecting surfaces and will be, to a certain extent, compressed between the diaphragm and said surfaces. The deflecting impact surfaces are so  
35 arranged that the granules of carbon will be deflected. In passing over the upper edges thereof, to a certain extent, will cause the particles of carbon to move among themselves so as to prevent packing.  
40 The form illustrated in Figs. 7, 8 and 9 shows the deflecting surfaces somewhat like the sectors of a circle. These different surfaces are, however, placed at an angle like the vanes of a wind wheel. In this form I  
45 preferably place at the center a stud with a conical head, as shown.

The different forms of my device, it will be seen, operate in a similar manner, the requisite being that they shall be suspended

above the diaphragm and be at an angle there- 50 to. The angle between these impact surfaces and the diaphragm may be varied; for example, in the skirt or funnel shape form of my device illustrated in Figs. 2, 3 and 4, the angle is preferably about forty-five degrees, 55 while the conical surfaces illustrated in Figs. 5 and 6 may be, say, at an angle of thirty degrees. In like manner, as shown in Figs. 5, 6 and 7, which I term the wind wheel form of my device, the surfaces are at an angle of 60 about thirty degrees to the plane of the diaphragm.

Having thus described the preferable form of my device and different modifications thereof, I wish it to be understood that I do not 65 limit myself to the particular forms of mechanism shown or described, since any suitable equivalent inclined impact surfaces suspended in the carbon above the diaphragm would be operative to accomplish the desired re- 70 sult. It will also be understood that these disks or electrodes provided with inclined deflecting impact surfaces, as illustrated in Figs. 2, 3 and 4 or in Figs. 5, 6 and 7, may be readily substituted in long distance telephone trans- 75 mitters of the class referred to for the electrodes or disks now in use therein.

Having thus described my invention, I claim as new and desire to secure by Letters 80 Patent:

1. A carbon telephone transmitter disk electrode provided with inclined concentric rings forming deflecting surfaces, substantially as described.

2. In a telephone transmitter, the combina- 85 tion, with a diaphragm, of granulated carbon resting in contact therewith, an electrode suspended within said granulated carbon, said electrode having inclined deflecting impact surfaces, whereby the particles of carbon are 90 caused to circulate upon the vibration of said diaphragm, substantially as described.

In witness whereof I hereunto subscribe my name this 8th day of May, A. D. 1888.

CHARLES E. SCRIBNER.

Witnesses:

CHAS. C. WOODWORTH,  
CHAS. G. HAWLEY.