(No Model.)

T. A. WATSON.

TELEPHONE POLE PIECE.

No. 251,326. Patented Dec. 20, 1881.

Fig: 1.

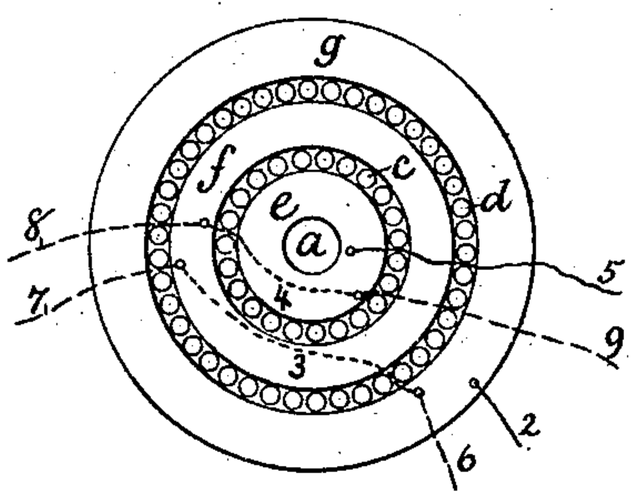


Fig: 2.

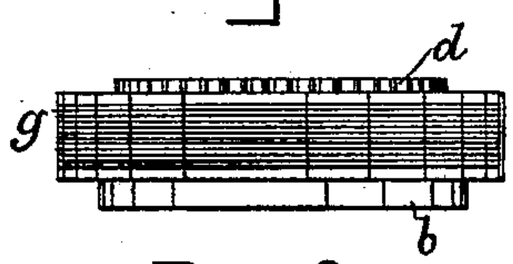
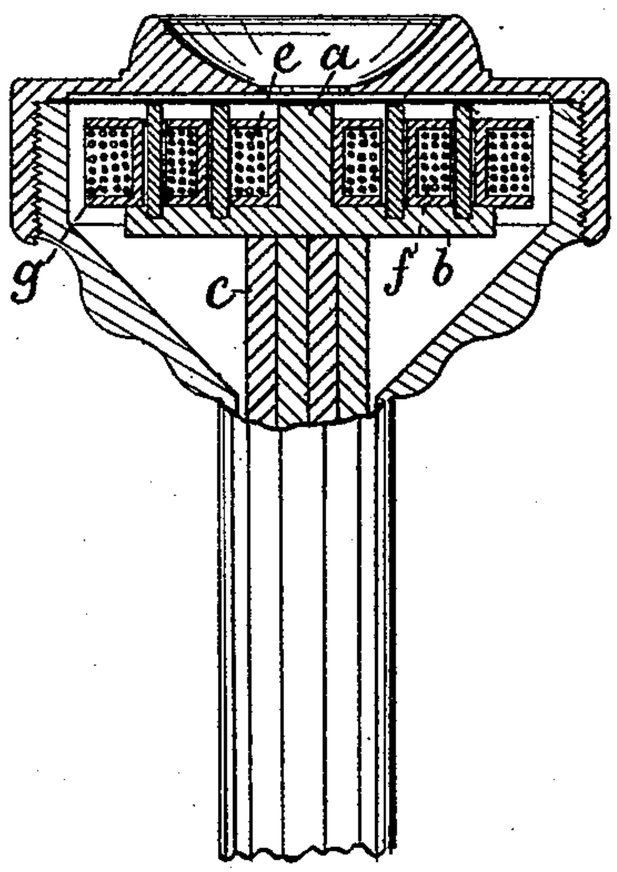


Fig: 3.



Witnesses.

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UNITED STATES PATENT OFFICE.

THOMAS A. WATSON, OF EVERETT, ASSIGNOR TO THE AMERICAN BELL TELEPHONE COMPANY, OF BOSTON, MASSACHUSETTS.

TELEPHONE POLE-PIECE.

SPECIFICATION forming part of Letters Patent No. 251,326, dated December 20, 1881.

Application filed April 29, 1880. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. WATSON, of Everett, county of Middlesex, State of Massachusetts, have invented an Improvement in Telephone Pole-Pieces, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to pole-pieces for magnets, and is shown embodied in a pole-piece for a compound telephone such as described in another application filed by me herewith.

As usually constructed, the pole-piece of a telephone, or the core of the small electro-magnet attached to the end of and polarized by a permanent magnet, is a small cylinder of iron surrounded by the induction-coils.

As the electric current in an induction-coil has the strongest effect in the layers of wire nearest the core, it is obvious that the effect will be increased by bringing as large a portion of the said coils as possible next to the surface of the core or pole-piece. This I accomplish in accordance with my invention by the employment, in addition to the usual central core surrounded by an induction-coil, of a second pole-projection surrounding the said coil, and consequently adjacent to the outer helices of the said coil, and, as herein shown, a series of the said pole-projections are arranged as a series of annular rings concentric with the usual central cylindrical core, the coils lying in the annular space between the said pole-projections, which are all connected with a disk of soft iron, which may be attached to the end of the usual permanent magnet of a magneto-telephone.

It will be readily understood that a pole-piece of this sort is especially adapted for use in a compound telephone such as described in my other application, wherein a series of circuits or groups of circuits are connected with separate and independent induction-coils in a telephone with a single sound chamber and passage; and when the pole-piece of the present invention is employed the separate coils may be placed each in a separate annular channel between two pole-projections, or they may be wound side by side, each separate coil then filling a portion of each and all of the said annular spaces.

Figure 1 is a top view of the pole-piece embodying my invention; Fig. 2, a side view thereof, and Fig. 3 a longitudinal section of the upper portion of a telephone provided with one of the said pole-pieces.

The pole-piece consists of the usual central core, *a*, connected with a circular plate, *b*, adapted to be attached in any convenient manner to the permanent magnet *c*. Connected with the plate *b* are two other pole-projections, *c d*, (shown as series of pins arranged in circles concentric with the central core, *a*.) Making the pole-projections *c d* as a series of pins enables them to be easily connected with the plate *b*, they being merely inserted with a tight fit in a series of holes drilled or punched in the said plate.

It is obvious that the pole-projections *c d* may be made as solid rings or tubes, and that they may be of any desired shape. The coils *e f g* are placed in the spaces between and around the pole-projections *a c d*, thus being in the most favorable position to enable the electric currents in the said coils to have as strong an effect as possible upon the said pole-piece.

When desired for use in an ordinary telephone, the coils may all form one continuous circuit from 2 to 5, being connected as shown by the dotted lines 3 4, Fig. 1; or, if the instrument is intended to be used as a compound telephone with separate coils in independent circuits, each spool *e f g* may contain an independent coil, as indicated by the lines 5 9, 7 8, and 2 6; or the independent circuit-coils may be wound side by side, each spool containing a portion of each coil and each coil occupying a portion of each and all of the spools.

In Fig. 3 the magnet and compound pole-piece and coils are shown inclosed in a common telephone-case provided with a diaphragm and single sound-passage.

It is obvious that a pole-piece made as herein described also affords a much larger surface to act upon and be acted upon by the diaphragm of the telephone.

I claim—

1. An electro-magnet for telephones, comprising a permanent magnet, a number of concentric pole-pieces of soft iron, and insulated

wire coiled in the spaces between said pole-pieces, substantially as described.

2. The combination, in a telephone, of the diaphragm and an electro-magnet having a number of concentric soft-iron pole-pieces, with insulated wire coiled in the spaces between the said soft-iron pole-pieces, substantially as described.

3. The herein-described pole-piece, consisting of a plate provided with a series of pole-projections, made as concentric or parallel rows of pins, inserted in the said plate and adapted to receive coils of insulated wire between the said rows, substantially as described.

4. In a compound telephone, a series of concentric helices of insulated wire connected in separate circuits, and combined with pole-pieces and a diaphragm, substantially as described.

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

THOMAS A. WATSON.

Witnesses:
JOS. P. LIVERMORE,
N. E. C. WHITNEY.