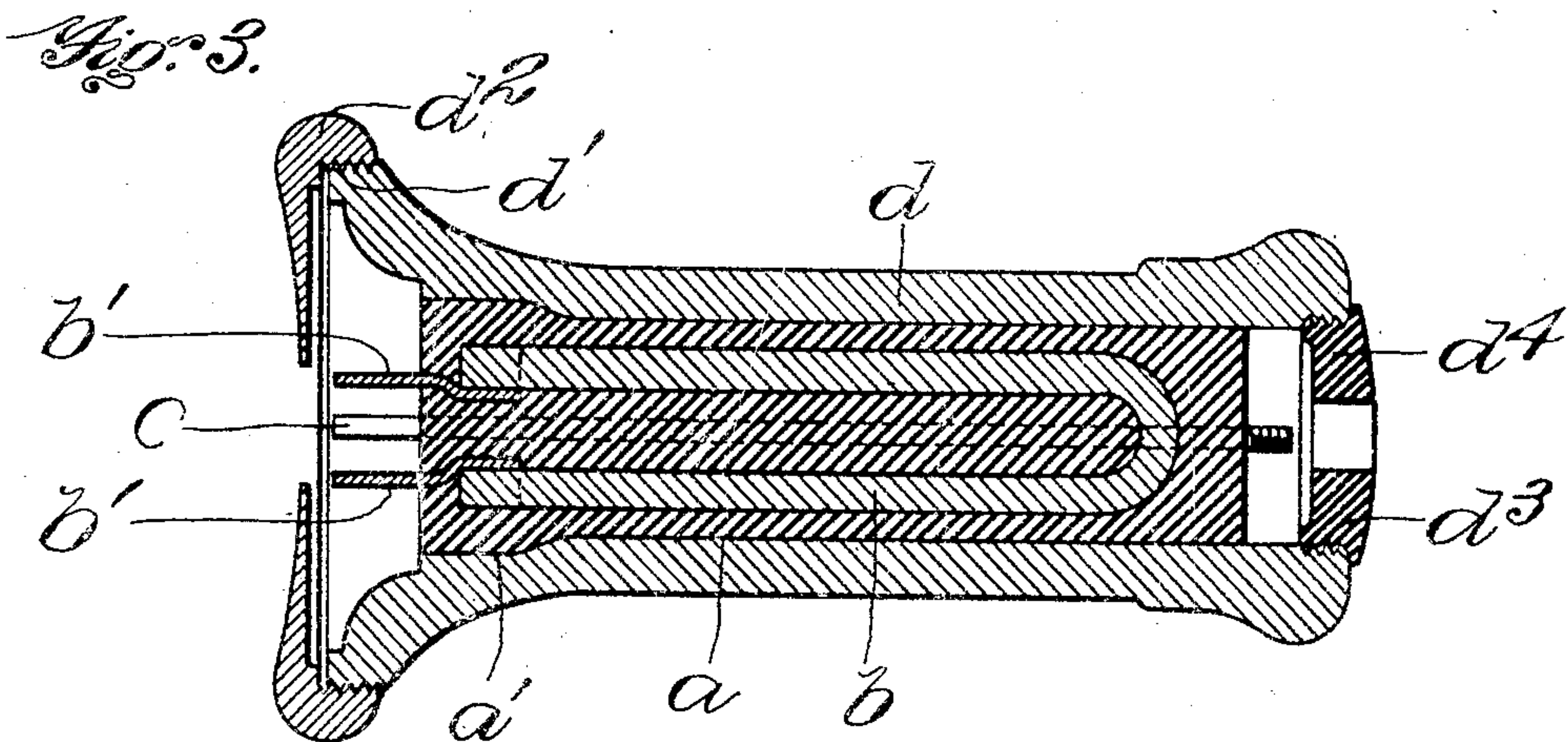
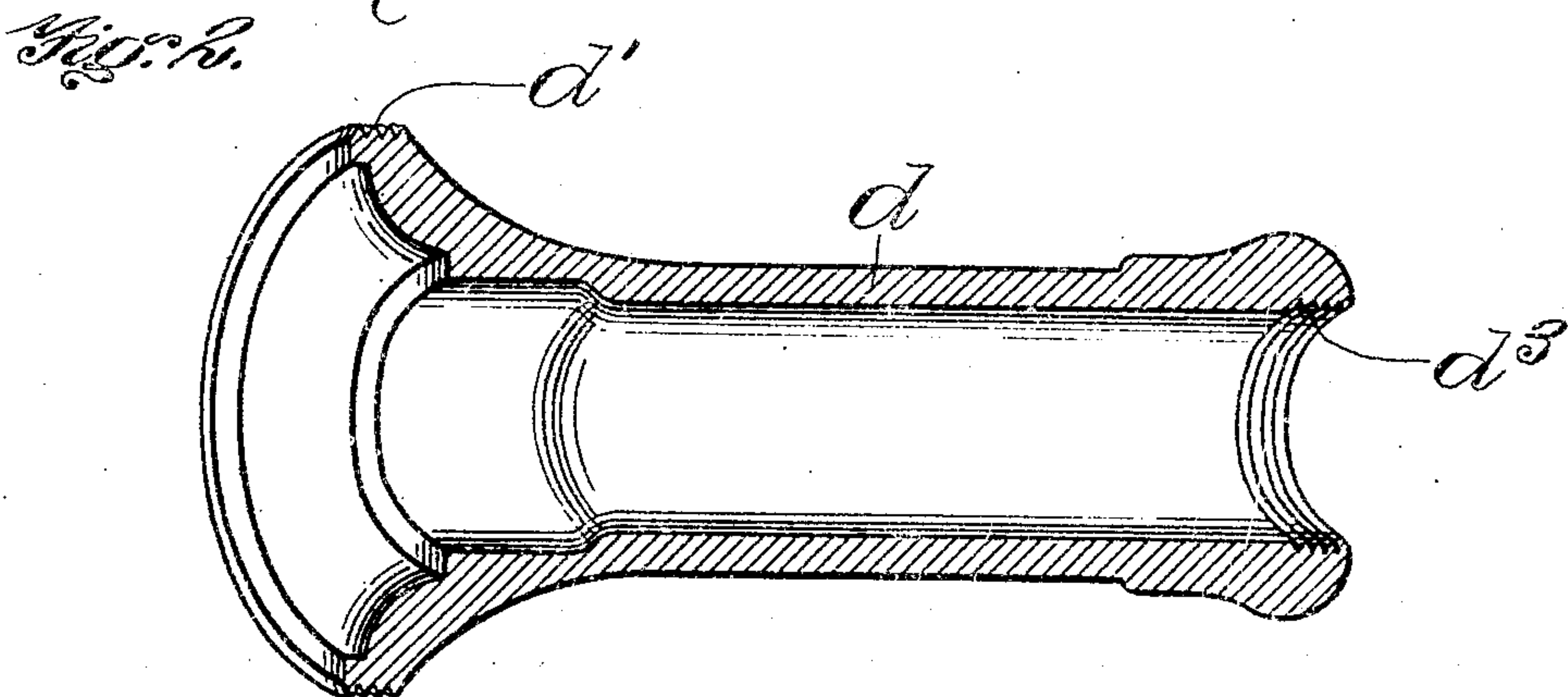
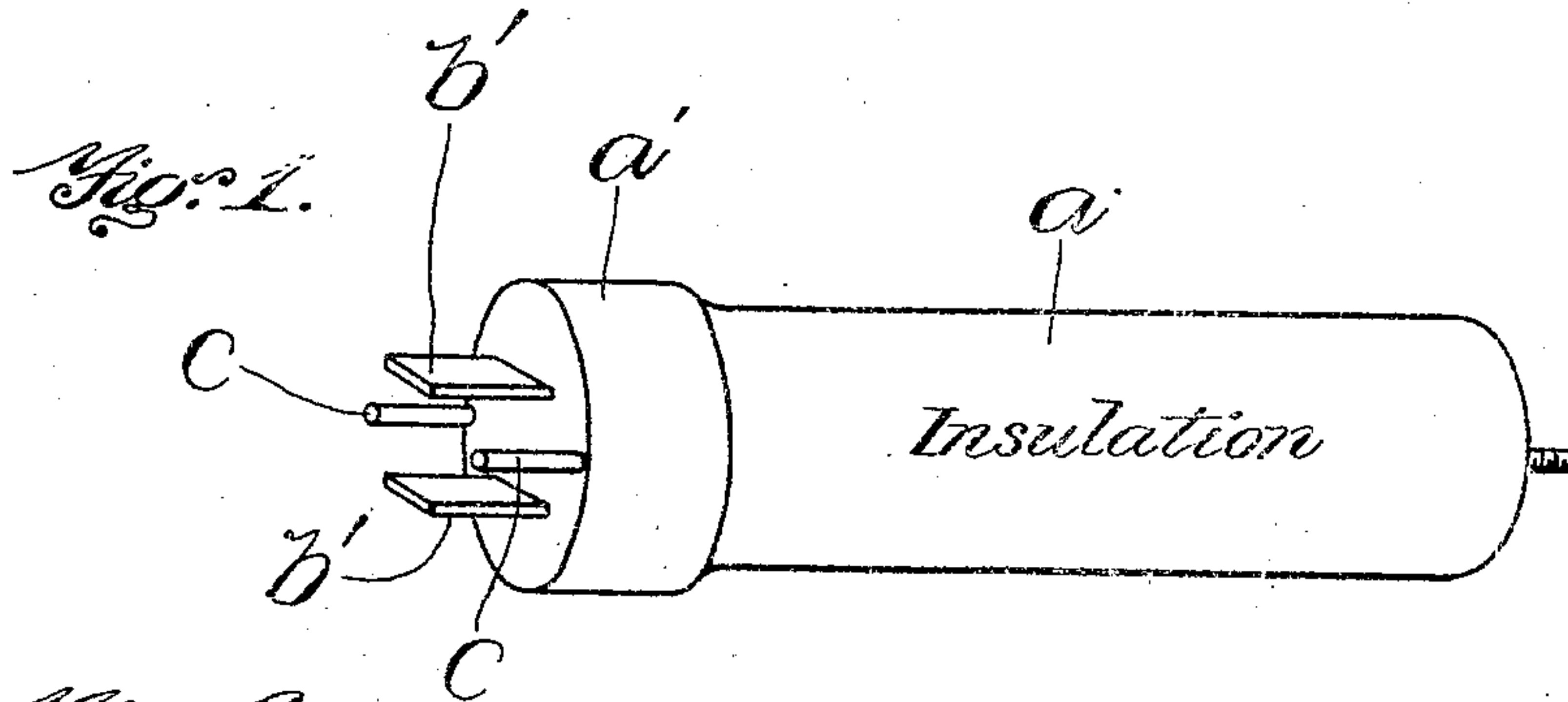


No. 786,588.

PATENTED APR. 4, 1905.

W. J. MURDOCK.
TELEPHONE RECEIVER.
APPLICATION FILED JULY 21, 1904.



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UNITED STATES PATENT OFFICE.

WILLIAM J. MURDOCK, OF BOSTON, MASSACHUSETTS.

TELEPHONE-RECEIVER.

SPECIFICATION forming part of Letters Patent No. 786,588, dated April 4, 1905.

Application filed July 21, 1904. Serial No. 217,565.

To all whom it may concern:

Be it known that I, WILLIAM J. MURDOCK, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Telephone-Receivers, of which the following is a specification.

This invention relates to that class of telephone-receivers shown in Letters Patent of the United States No. 655,726, granted to me August 14, 1900. In said patent I have set forth and claimed a telephone-receiver comprising a shell or case of insulating material and a magnet for operating the diaphragm, the shell or case being provided with integral retaining portions projecting over and about the magnet, whereby the magnet is rigidly supported and held within the case. The said shell or case in practice is molded upon the magnet while the material of said shell is in a plastic condition.

The construction above set forth is better and cheaper than former constructions, in which the magnets and other parts were detachably secured to the insulating material of the casing, as fully set forth in said Letters Patent.

The present invention has for its object to provide a telephone-receiver having the same advantages as to cheapness and durability as those possessed by the article set forth in the above-mentioned patent, and, further, to provide a shell or casing composed of two separately-formed parts, one of which is an inner section in which the magnet is embedded and retained, while the other is an outer section or shell, which may be made of a different material from that of which the inner section is composed.

The invention consists in the improvements hereinafter described and claimed.

Of the accompanying drawings, forming a part of this specification, Figure 1 represents a perspective view of the inner case-section. Fig. 2 represents a perspective view of the outer case-section or shell. Fig. 3 represents a longitudinal sectional view showing the two case-sections assembled.

The same reference characters indicate the same parts in all the figures.

In the drawings, *a* represents the inner case-section, which may be of any suitable form and when made as a part of a Bell receiver is preferably made of cylindrical form and provided with an enlargement *a'* at one end. The ordinary permanent magnet *b* is embedded in the material of the inner section *a* while the latter is in a plastic condition, the said section when completed having integral retaining portions bearing upon the magnet and preventing displacement thereof in any direction. The pole-pieces *b' b'*, which support the coils or spools of wire causing the vibration of the diaphragm, project from the larger end *a'* of the inner section. The wires or wire rods *c c*, to which the usual flexible circuit-wires are connected by binding-posts, as usual, also project from the larger end of the inner section. It will be understood that the inner section *a* is necessarily made of a suitable insulating material.

d represents the outer case-section or shell, which may be made of any suitable material, whether insulating or otherwise. The preferred material of the said shell is hard rubber, but metal or any other suitable material may be used therefor. The shell *d* is formed internally to accurately fit and conform to the external surface of the inner section *a*. The two sections may be secured firmly together in any suitable way—by shrinking the shell upon the inner section, by using the shell as a mold in which to form the plastic material of the inner section, or by screwing the inner section into the shell, an internal thread being formed in the outer section and an external thread on the inner section. As here shown, the shell is provided at its larger end with an external screw-thread *d'* for engaging the internally-threaded flange on the diaphragm-securing head *d''*. The opposite end of the shell is provided with an internal thread *d'''* to engage the insulating-bushing *d''''*, through which the circuit-wires pass. It will be seen that the close fit of the shell upon the inner section gives the casing as a whole the same degree of rigidity that would be possessed if the entire casing were molded or formed as one part. The two-part construction enables the inner section to be made of a material

which while relatively cheap and sufficiently rigid for the purpose of holding the magnet has not sufficient tensile strength to enable satisfactory screw-threads to be formed upon it. The outer section or shell \mathcal{A} may be made of a material possessing greater tensile strength, so that screw-threads formed upon it will not be unduly brittle. The support afforded the shell by the inner section enables the walls of the shell to be made so thin as to reduce to the minimum the expense for material without danger of breakage of the shell.

I claim—

A telephone-receiver comprising a diaphragm-operating magnet, a continuous inner case-section of insulating material having integral retaining portions engaged with said

magnet, and a continuous outer case-section or shell closely conforming internally to the exterior of the inner section and secured to the latter and extending beyond both ends thereof, the inner and outer sections differing from each other in the characteristics of the material of which they are constructed, whereby a relatively inexpensive, although brittle, material may be employed for the inner section and the necessary strength and protection imparted by the outer shell or section.

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

WILLIAM J. MURDOCK.

Witnesses:

C. F. BROWN,

E. BATCHELDER.