

(No Model.)

W. H. EASTMAN.  
MECHANICAL TELEPHONE.

No. 411,767.

Patented Sept. 24, 1889.

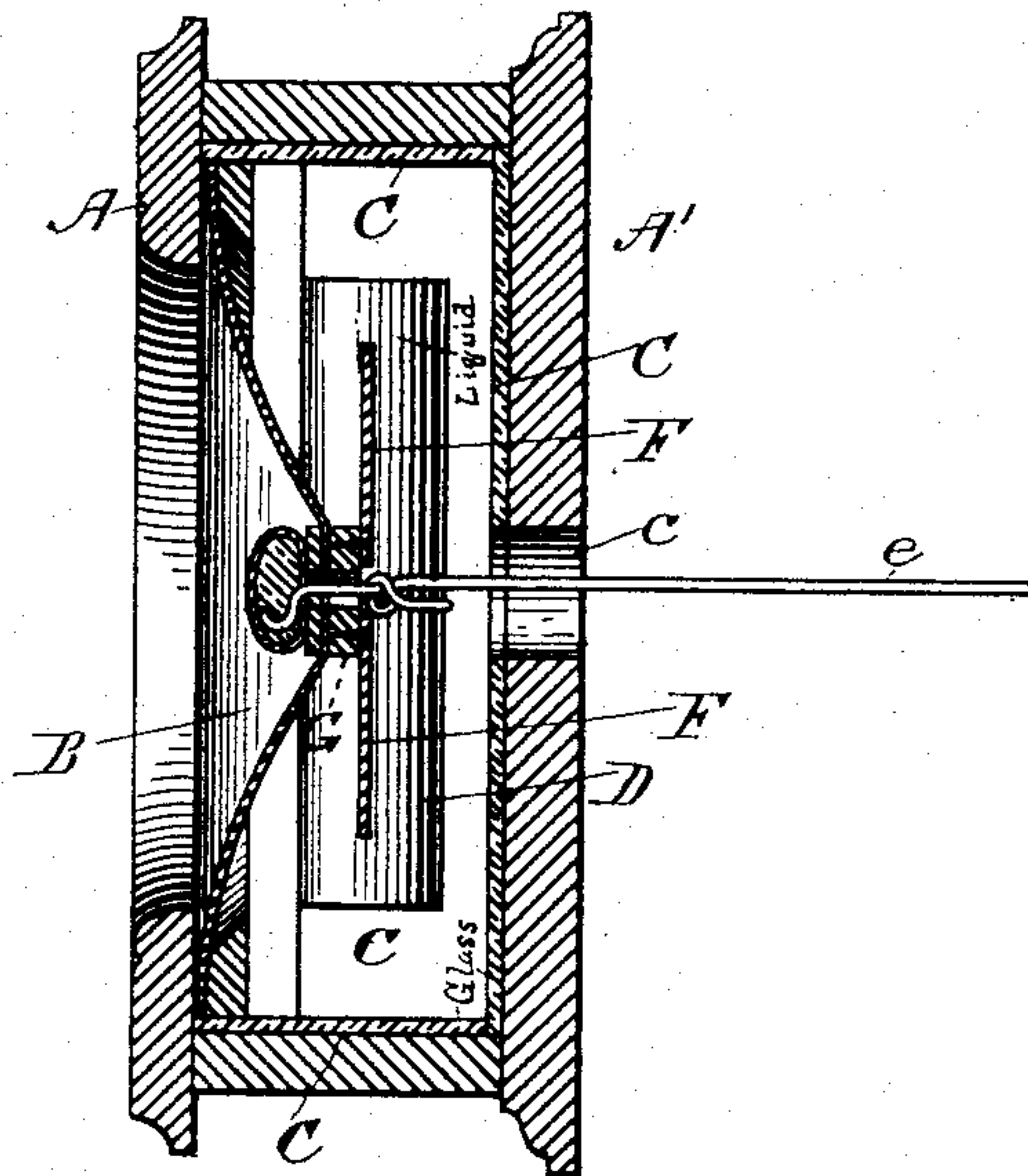


Fig. 1.

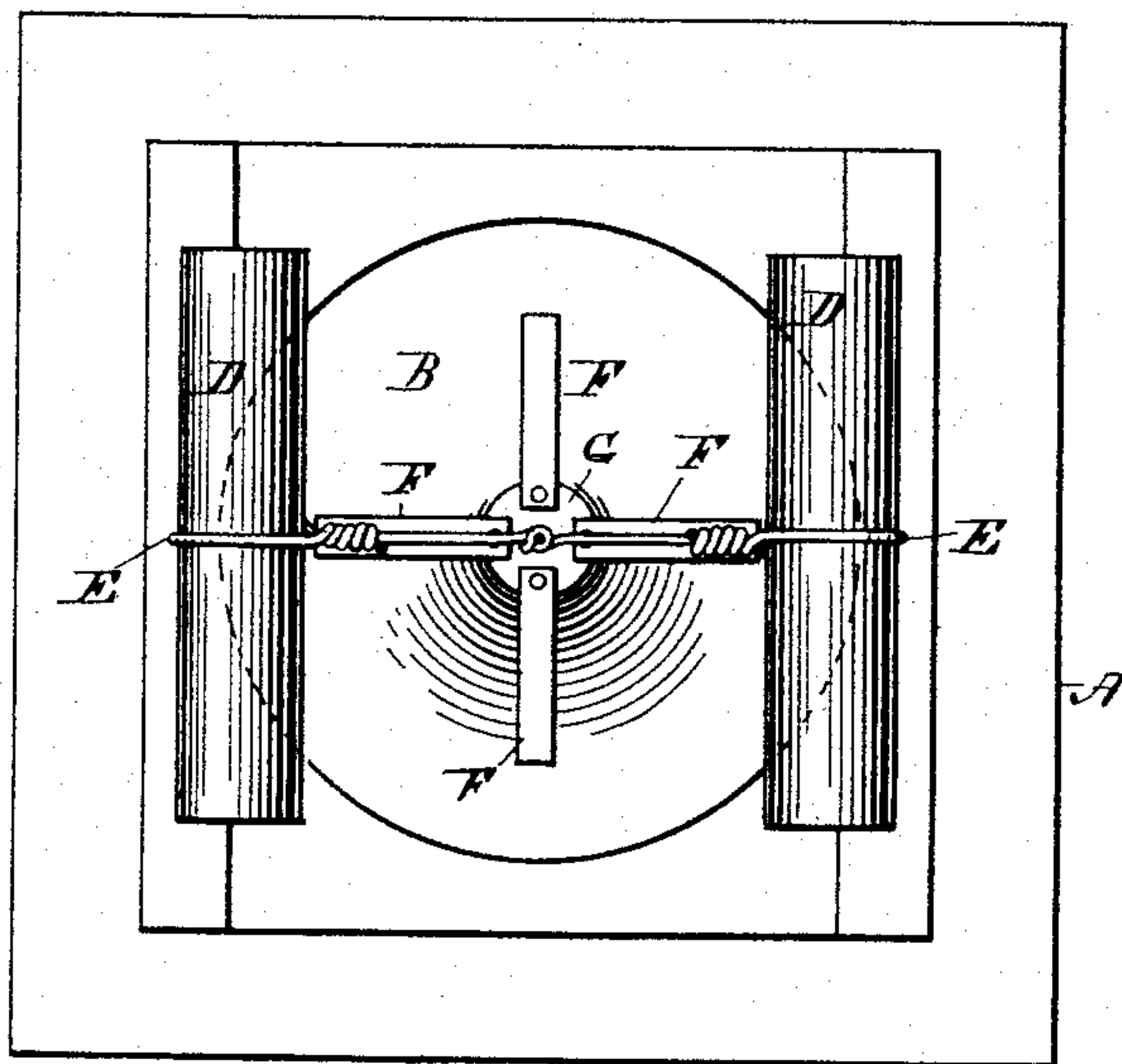


Fig. 2.

WITNESSES.

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# UNITED STATES PATENT OFFICE.

WILLIAM H. EASTMAN, OF CONCORD, NEW HAMPSHIRE.

## MECHANICAL TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 411,767, dated September 24, 1889.

Application filed August 6, 1888. Serial No. 282,067. (No model.)

*To all whom it may concern:*

Be it known that I, WILLIAM H. EASTMAN, of Concord, in the county of Merrimac and State of New Hampshire, a citizen of the United States, have invented certain new and useful Improvements in Mechanical Telephones, of which the following is a specification.

My invention relates to that class of telephones in which speech and other sounds are transmitted from one point to another distant point by the mechanical vibrations of a connecting line or wire stretched between the transmitting and receiving diaphragms.

The object of my present invention is to improve the construction of such telephones in certain particulars whereby their efficiency is increased.

My present improvements include, first, an improved construction of the interior lining of the box or case which lies in the rear of the diaphragm; secondly, the use of a liquid-containing chamber or chambers connected by a cross wire or wires to the transmitting-wire for the purpose of taking up and deadening extraneous vibrations, and, thirdly, certain improvements in the construction of the diaphragm itself with a view to increasing the clearness of the enunciation of the instrument.

In the accompanying drawings I have shown in Figure 1, in vertical section, a mechanical telephone embodying my present improvements, and in Fig. 2 a plan view of the rear of the diaphragm and the adjacent portions of the instrument, in order to represent more clearly the construction of certain portions of the invention.

In the drawings I have shown the ordinary telephone-case, made, for convenience, in two parts A A', of which A may be called the "cover" and A' the "box." As is shown in Fig. 1, and according to the usual construction, the diaphragm B surrounds a circular orifice in the cover A of the case, and the rear of the diaphragm is inclosed within the box part A' of the case.

My first improvement consists in providing an inclosed chamber of glass in the rear of the diaphragm and surrounding or inclosing it, as shown. This chamber may conveniently be formed with a box of the shape shown at

A' by lining the interior thereof with strips of glass, represented in the drawings at C C C C. The rear of this chamber opposite the center of the diaphragm is of course provided with a suitable aperture *c*, through which the line-wire passes. Frequent tests of mechanical telephones embodying this feature of my present invention have satisfied me that such a glass lining or chamber in the rear of the diaphragm improves the operation of the instrument very materially. I believe this result to be due to the high degree of reflective power possessed by a lining so constructed.

The second feature of my present improvement consists in the employment of a deadening chamber or chambers for receiving or taking off from the line-wire extraneous vibrations which otherwise would interfere with and prevent the correct articulation of the instrument. Among such extraneous vibrations I include all rate vibrations, either of the conducting-wire or any of its supports, as distinguished from speech vibrations, which the instrument is intended to transmit—in other words, any and all vibrations not essential to the transmission of speech or other sounds to be transmitted. To accomplish this I provide one or more liquid-tight chambers D D, which may be attached to the frame of the instrument in any convenient way, and filled with a suitable liquid—as, for example, water or alcohol. A suitable vibration-transmitter E—as, for instance, a short wire—is stretched with moderate tension from the transmission-line *e* of the instrument to the liquid-inclosing chamber. By means of this improved construction extraneous vibrations upon the line-wire are carried off to the liquid-containing chamber and there deadened or rendered harmless so far as the transmission of speech by the instrument is concerned. In practice I have used a pair of these vibration-deadening devices, arranged as shown, and have obtained good results therewith; but a larger or smaller number may be used, if desired.

The third feature of my present improvement consists in the addition to the center of the diaphragm at the rear of a metallic rider, preferably in the form of four cross-arms F F F F, as shown. I have found in practice



that a very good material for these arms is light spring-brass. They may conveniently be attached to the diaphragm by means of a button G, of soft material—as, for example, 5 leather—which may be glued or otherwise connected to the center of the diaphragm, and which is centrally perforated for the passage of the line-wire.

10 With a pair of mechanical telephones containing my improvements as hereinabove set forth I have talked successfully over a line not less than one and one-half mile in length.

I claim—

15 1. In a mechanical telephone, a case or lining of glass in the rear of and inclosing the diaphragm, substantially as set forth.

2. In a mechanical telephone, the combination, with the transmission-line, of a device for deadening extraneous vibrations, consist-

ing of a liquid-tight chamber filled with a suitable liquid, as water or alcohol, and a vibration-conductor extending from the said chamber to the line-wire, substantially as set forth. 20

3. In a mechanical telephone, the combination, with the diaphragm, of a rider provided with metallic arms, as F F F F, said rider being suitably connected with the center of said diaphragm, and perforated to allow the passage of the line-wire, all substantially as set forth. 25 30

In testimony whereof I have hereunto subscribed my name this 30th day of July, A. D. 1888.

WILLIAM H. EASTMAN.

Witnesses:

J. HENRY TAYLOR,  
E. B. TOMLINSON.