

No. 720,621.

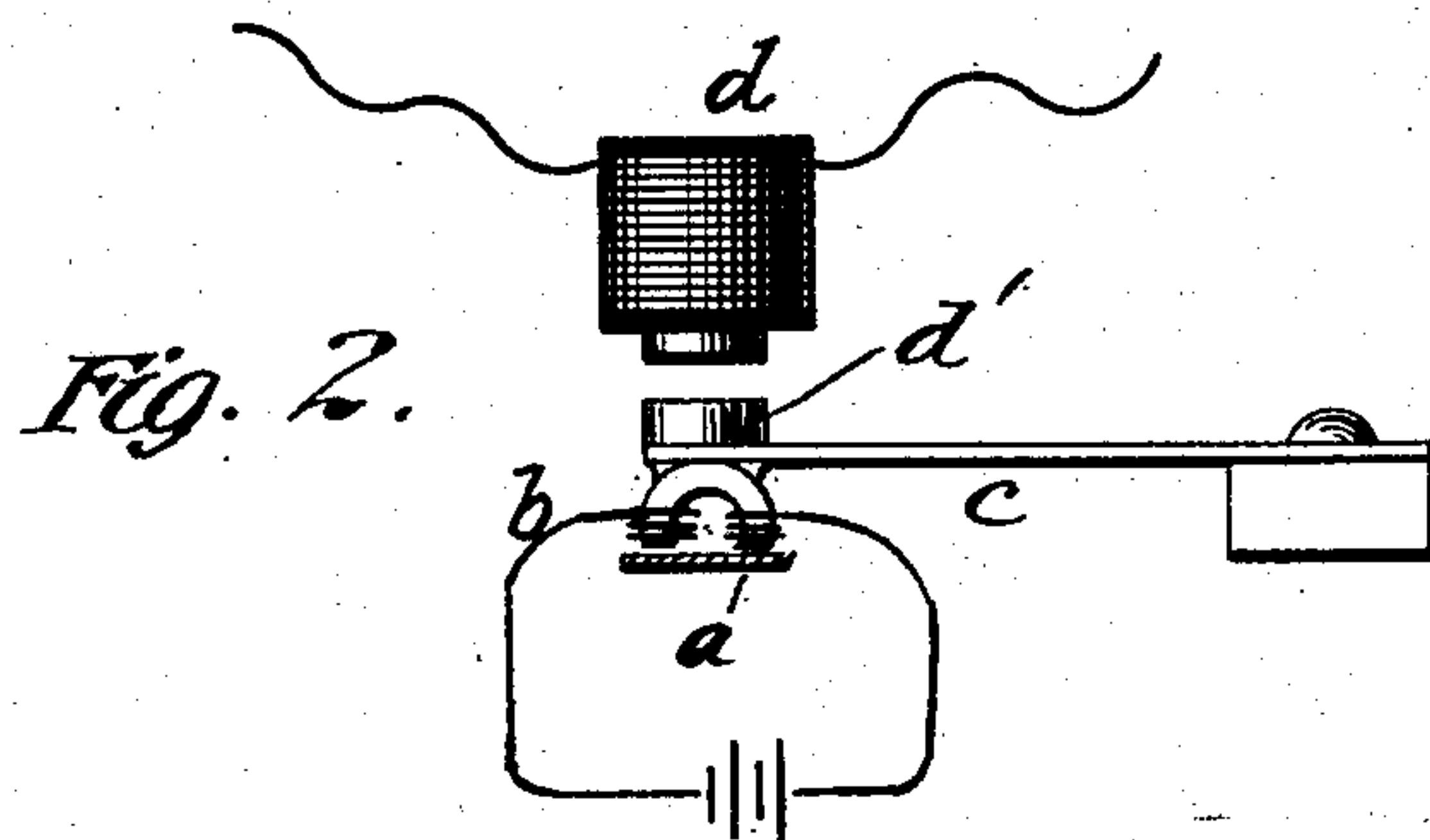
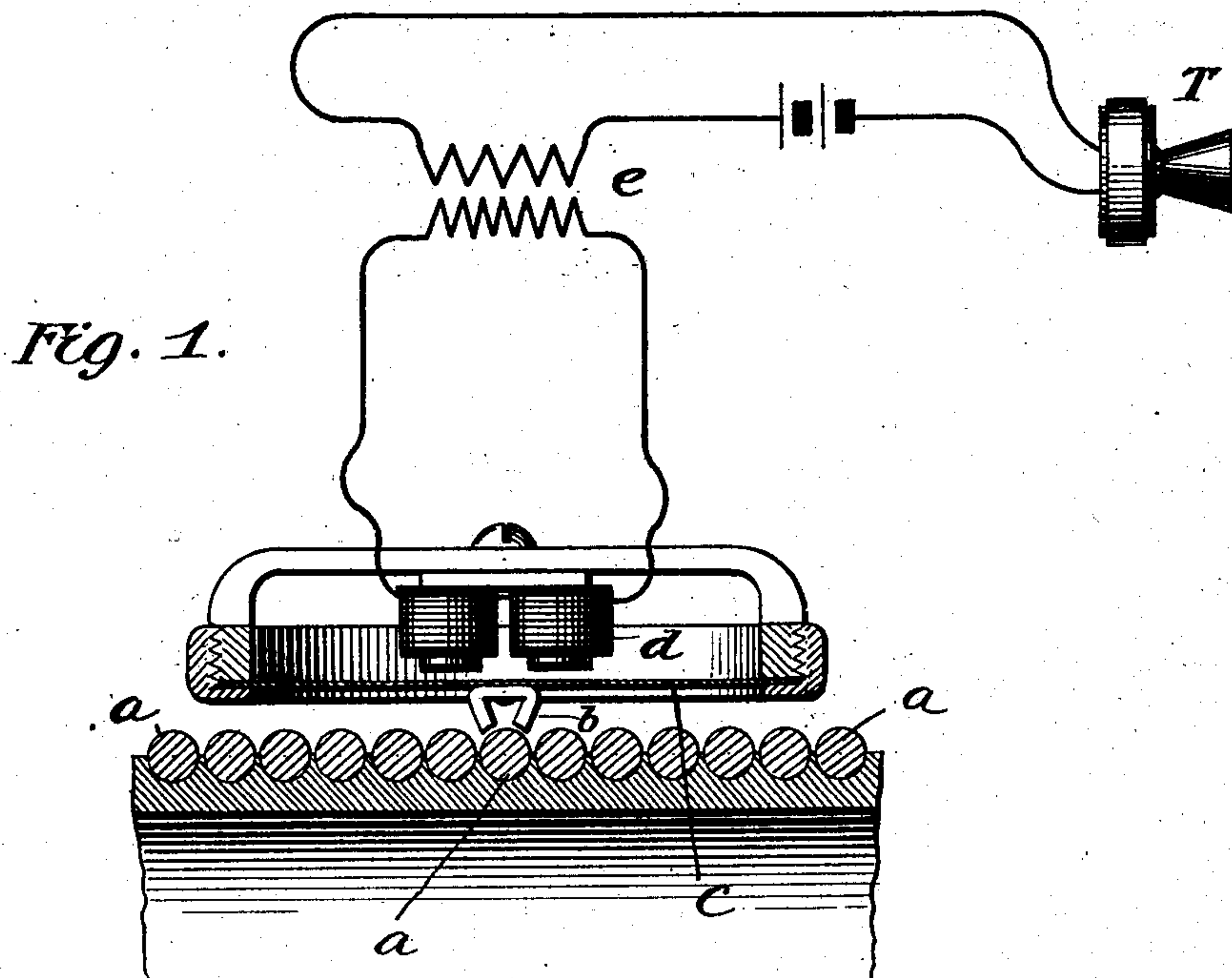
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W. A. ROSENBAUM.

APPARATUS FOR ELECTROMAGNETICALLY RECORDING SPEECH.

APPLICATION FILED JUNE 22, 1901.

NO MODEL.



WITNESSES:

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APPARATUS FOR ELECTROMAGNETICALLY RECORDING SPEECH.

SPECIFICATION forming part of Letters Patent No. 720,621, dated February 17, 1903.

Application filed June 22, 1901. Serial No. 65,563. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. ROSENBAUM, a citizen of the United States, residing at New Rochelle, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Apparatus for Electromagnetically Recording Speech, of which the following is a full, clear, and exact description.

10 This invention relates to apparatus for recording and reproducing speech or signals represented by undulating or irregular currents of electricity. The invention is in the same class with that described in Letters Patent of the United States No. 661,619, issued to Valdemar Poulsen, November 13, 1900, and has special reference to means for recording speech, the Poulsen or any other approved method of reproducing the record being used
15 in combination therewith. The plan described in the Poulsen patent for recording the electrical impulses consists in using an electromagnet in a circuit over which such impulses flow, the poles of the magnet resting upon a steel body, which is moved with respect thereto. The successive variations in the strength of the magnet are thereby imparted to successive parts of the steel body and are retained thereby for reproduction at
20 any desired time. According to my invention I record the impulses by means of a permanent magnet or an electromagnet of constant strength, and I vary the effect which such magnet has upon the steel body by altering its distance from said body in accordance with or in proportion to the strength of the impulses representing the voice or signals. In other words, the poles of my recording-magnet are not in contact with the steel
25 body, and the effect upon the steel body is obtained by altering the air-gap between the said poles and the body. The electromagnet used by Poulsen for recording I utilize to alter the said air-gap.

30 The details of my invention will be fully described with reference to the accompanying drawings, in which—

35 Figure 1 is a conventional representation of my recording apparatus, and Fig. 2 a modification thereof.

Referring to the drawings by letter, *a* represents in cross-section the steel body adapt-

ed to receive the magnetic impressions. In Fig. 1 this body is in the form of a wire, while in Fig. 2 it is in the form of a tape or
40 band.

b represents a permanent magnet rigidly attached to a spring *c*. The spring in Fig. 1 is a diaphragm, at the center of which the permanent magnet is located. The spring normally holds the poles of the permanent magnet out of contact with the steel body; but the spring would naturally be under some tension at all times on account of the attraction existing between the said magnet and
45 the steel body.

d is an electromagnet the pole or poles of which are located behind the spring *c* and face up the armature *d'*, attached to the back of the spring, as shown in Fig. 2, or when the diaphragm shown in Fig. 1 is used said diaphragm may be of magnetic material and constitute the armature for the magnet. The magnet *d* is in the secondary circuit of an induction-coil *e*, the primary circuit of which
50 contains a telephone-transmitter *T*.

Now it will be seen that when the voice-currents which are created in the primary circuit by speaking into the transmitter flow by induction in the secondary circuit, including the magnet *d*, the said magnet will be energized successively thereby in accordance with the strength of such currents. The magnet will in turn attract the armature in front of its poles to varying extents, which
55 will cause the poles of the permanent magnet to approach and recede from the steel body, or, in other words, will vary the air-gap between the permanent magnet and the steel body coincident with and in proportion to the impulses originally created by the voice. The result of this will be that the steel body *a*, which is at the same time moving past the poles of the permanent magnet, will be magnetized at successive points to corresponding
60 varying degrees, and such magnetism will be retained by the steel body for subsequent use in reproducing the voice-currents in a telephone-receiver.

The magnet is not necessarily a "permanent" magnet, since an electromagnet connected in circuit with a constant source of electricity, as shown in Fig. 2, will serve the same purpose.

In order to reproduce the record thus made in the steel body, an electromagnet whose poles are placed in contact with the steel body may be passed over that portion of the steel
5 body which received the impressions, whereupon currents corresponding to the original currents will be generated in the coil of the magnet and sent over the circuit to a telephone-receiver; but, as before stated, the re-
10 producing is not a part of the present invention.

Having described my invention, I claim—

1. An apparatus for magnetically recording speech or signals represented by electrical
15 impulses, consisting of the combination of a body adapted to receive and retain magnetic impressions, a constant magnet whose pole or poles is presented to said body, the magnet and body being movable with respect to each
20 other, and means for varying the space between said pole or poles and body, coincident with and in proportion to said electrical impulses, respectively, substantially as de-
scribed.

2. An apparatus for magnetically recording speech or signals represented by electrical
25 impulses, consisting of the combination of a body adapted to receive and retain magnetic impressions, a constant magnet whose pole or poles is presented to said body, the magnet
30 and body being movable with respect to each other, and an electromagnet through which

passes said electrical impulses, said electromagnet being arranged to alter the space between the pole or poles of the constant mag- 35
net and said body, coincident with and in proportion to said electrical impulses respectively.

3. An apparatus for magnetically recording speech or signals represented by electrical 40
impulses, consisting of the combination of a body adapted to receive and retain magnetic impressions, a constant magnet whose pole or poles is presented to said body, means for moving the magnet and body with respect to 45
each other, a spring-support for said magnet and means for varying the space between said pole or poles and said body, coincident with and in proportion to said electrical impulses, respectively, substantially as described. 50

4. The combination of a traveling body adapted to receive and retain magnetic im-
pressions, a magnet of constant strength past the pole or poles of which said body travels, and means whereby sounds will act to vary 55
the distance between said body and the pole or poles of the magnet.

In witness whereof I subscribe my signature in presence of two witnesses.

WM. A. ROSENBAUM.

Witnesses:

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