

No. 882,328.

PATENTED MAR. 17, 1908.

J. A. LIEB.

AMPLIFYING MAGNET SYSTEM FOR TELEGRAPHERS.

APPLICATION FILED MAR. 25, 1907.

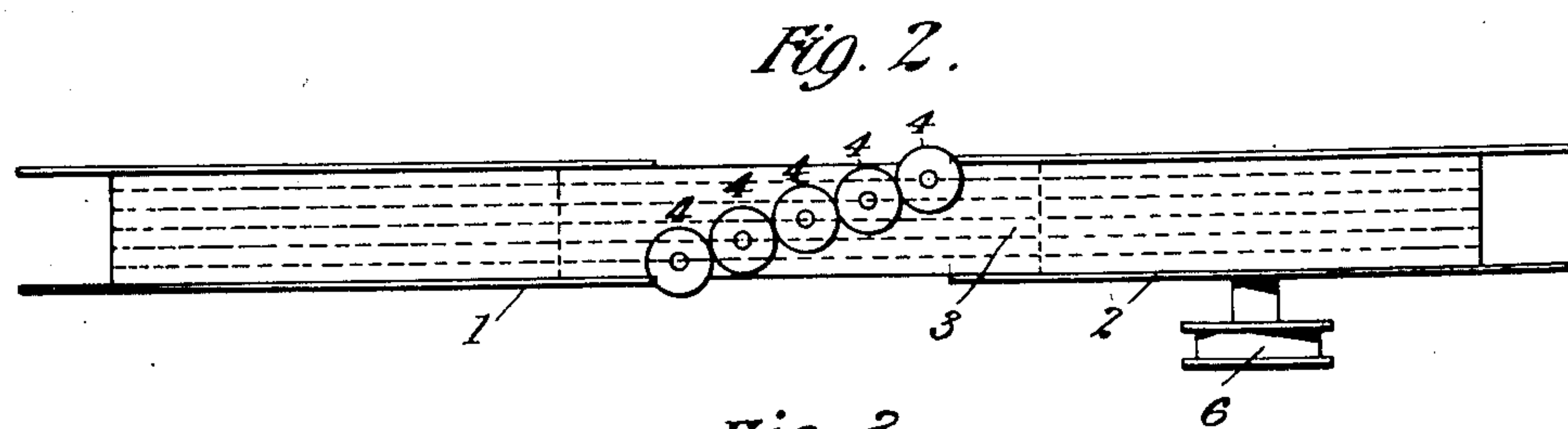
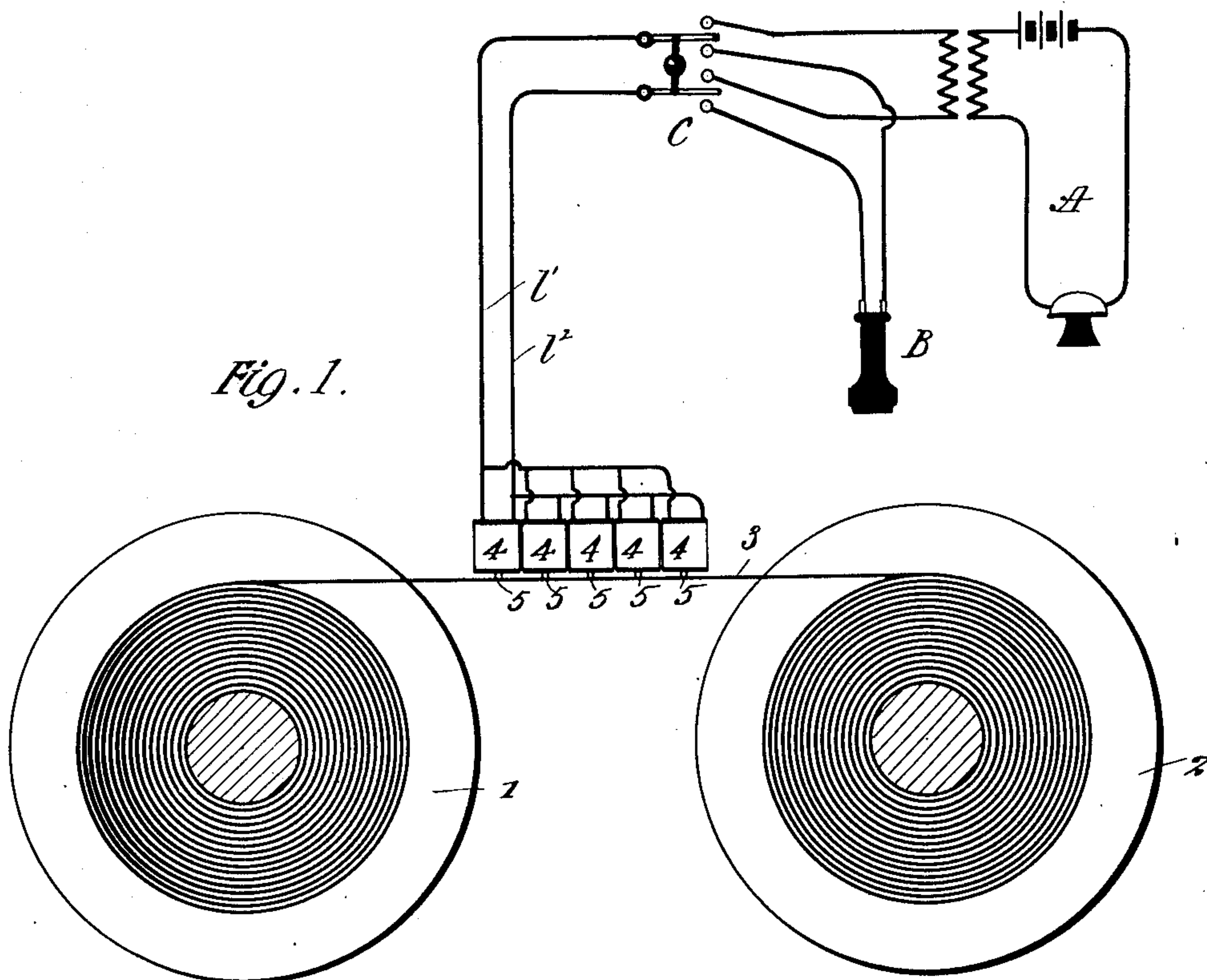
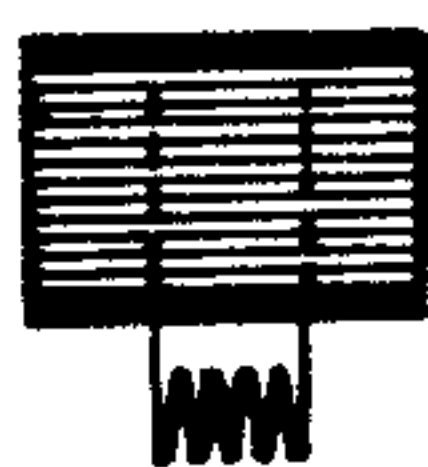


Fig. 3.



Witnesses:
Francis Ober
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By his Attorneys
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UNITED STATES PATENT OFFICE.

JOHN A. LIEB, OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN TELEGRAPHONE COMPANY,
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AMPLIFYING-MAGNET SYSTEM FOR TELEGRAPHONES.

No. 882,328.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed March 25, 1907. Serial No. 364,507.

To all whom it may concern:

Be it known that I, JOHN A. LIEB, a citizen of the United States, residing at the city of New York, in the borough of Brooklyn and State of New York, have invented certain new and useful Improvements in Amplifying-Magnet Systems for Telegraphones, of which the following is a full, clear, and exact description.

10 My invention relates to improvements in the apparatus for magnetically recording and reproducing sound known as the telegraphone.

The present invention is designed to secure better records with a given speed of the recording medium, or in some cases to reduce the speed of the medium without sacrificing the clearness and volume of the reproduced sound.

20 The essential principle of the telegraphone and similar apparatus depends upon the magnetization of a steel ribbon, plate, wire or disk, under the influence of the varying energization of an electromagnet in a telephone circuit and which afterward acts as a generator or transmitter to reproduce the sound. In order to make a permanent record in this way, and one which is capable of efficient reproduction, it is necessary in practice to have a very small magnet. But a small magnet does not generate the reproduction currents with as great intensity as is desirable, and attempts have been made to amplify the energy of the reproduction or retransmission currents in various ways.

35 By the present invention instead of using a single magnet, I divide the energy of the original receiving circuit among a number of small magnets, each of which is not larger than the prescribed size made necessary in telegraphone work.

The invention further consists in the features of construction and combination hereinafter set forth and claimed.

45 In the drawings: Figure 1 is a diagrammatic view showing an apparatus embodying the principles of my invention and having a steel ribbon or tape for the recording medium; Fig. 2 is a top or plan view of the same with the electrical circuits omitted; and Fig. 3 shows a magnet of slightly modified construction which may be used.

Referring to the drawings in which like parts are designated by the same reference sign, 1 and 2 indicate reels from one to the

other of which is wound the steel ribbon or tape 3 as required. This strip or ribbon therefore constitutes the recording medium and reproducing medium. 4 indicates electromagnets which have the small projecting poles 5. There are five of the magnets 4 shown, and each of these is of just sufficient size to utilize one-fifth of the energy of the telephone circuit.

The disposition of the magnets 4 is such that their poles 5 traverse different paths on the recording medium 3. For this purpose I have shown the magnets 4 lying in a row diagonally across the strip 3. This disposition gives each of the poles 5 a separate path of action, the various paths being, however, closely adjacent to one another so as to economize in the material of the recording medium.

The telephone circuits for the magnets 4 may be of the usual or any desired sort. I have shown a transmitting telephone set, A, and a receiver B, and a double blade switch C, by which the transmitting set or receiver are thrown on to the circuit wires 1' and 1². The magnets 4 are in a multiple circuit with the wires 1' and 1², but they could be equally well in a series circuit provided their winding resistance was made suitable therefor. The reels 1 and 2 are rotated to feed the recording medium 3 in any convenient way. I have shown a pulley 6 merely for the purposes of illustration. The character and the method of moving the recording medium do not constitute an essential part of the present invention.

While I have shown a particular construction having separate magnets 4, I do not desire to be limited or restricted thereto, since substantially the same results can be secured with a single magnet having a number of separate poles, that is to say, having the end of its iron core divided into a number of separate prongs which traverse different paths on the recording medium. This form of the invention is illustrated in Fig. 3.

What I claim is:—

1. The method of recording and reproducing sound, which consists in transforming the sound into telephonic currents, dividing the energy thereof among a plurality of separate magnets, moving a single steel medium past all of said magnets so that different paths are traced thereon by the poles of said magnets, said medium moving at a compara-

tively slow speed, and finally reproducing the sound by repeating said operation with said magnets in a single receiver circuit.

2. In an apparatus for magnetically recording sound, a plurality of magnets in a common telephone circuit, and a steel medium moving past said magnets, the different magnet poles describing different paths thereon.

3. In an apparatus for magnetically recording sound, a plurality of magnets in a common telephone circuit, and a steel tape or ribbon movable past said magnets, the different poles describing different paths thereon.

4. In an apparatus for magnetically recording sound, means in a telephone circuit for producing a plurality of magnet poles, and a steel tape or ribbon movable past said poles, the different poles describing different paths thereon.

5. In an apparatus for magnetically re-

ording sound, a plurality of magnets in a common telephone circuit, each of said magnets being of just such a size that the entire number just absorb the available energy of the telephone circuit, and a medium movable past the poles of said magnets the different poles describing different paths thereon.

6. In an apparatus for magnetically recording sound, a plurality of magnets in a common telephone circuit, and a steel tape or ribbon movable past said magnets, the different magnets lying in a diagonal row across the tape or ribbon, whereby the different poles each describe a different path on the tape or ribbon.

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

JOHN A. LIEB.

Witnesses:

WALDO M. CHAPIN,

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