J. H. IRWIN.

Speaking-Telephones.

No. 206,241. Patented July 23, 1878.

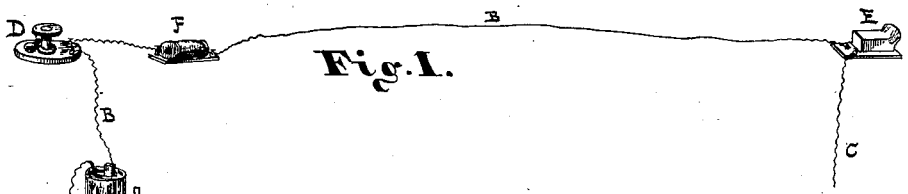
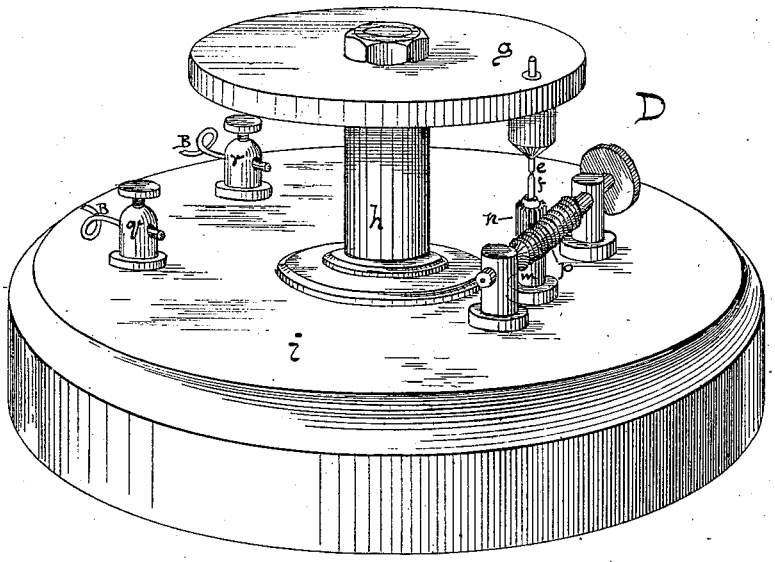


Fig. 1.

Fig. 2.



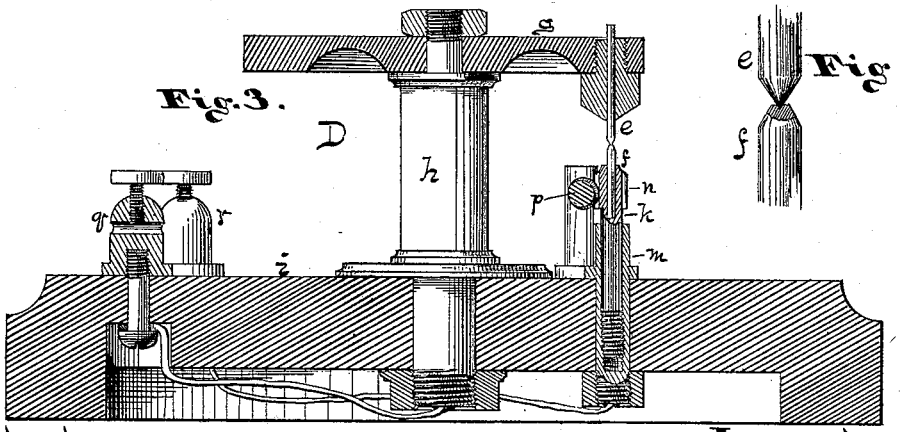


Fig. 3.

Fig. 4.

Attest.

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UNITED STATES PATENT OFFICE.

JOHN H. IRWIN, OF PHILADELPHIA, PENNSYLVANIA.

IMPROVEMENT IN SPEAKING-TELEPHONES.

Specification forming part of Letters Patent No. **206,241**, dated July 23, 1878; application filed June 12, 1878.

To all whom it may concern:

Be it known that I, JOHN H. IRWIN, of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented new and useful Improvements in Acoustic Telegraphy; and that the following is a full and complete specification of the same.

This invention relates especially to that branch of acoustic telegraphy which pertains to the transmission of articulate speech; and consists in a new method of controlling the electrical current and setting up therein of a series of undulations or periods of varying intensity corresponding to the sound-waves produced by the voice in speech.

I do not propose to discuss herein the laws of action which may be involved, because it does not appear to be necessary to the object in view; nor do I propose to restrict myself to the exact mechanical arrangement shown, to which, for convenience, I limit my description, because it appears evident that the same may be modified without imparting new qualities or producing essentially different results.

In all telephones capable of transmitting the sounds of articulate speech, so far as I am aware, the electrical undulations are controlled by the varying excitement produced by a diaphragm, disk, or plate vibrating in the immediate vicinity of a permanent magnet, or by the variable resistance of a conducting medium under strain.

In my receiver no magnet is present, and the electrical undulations are controlled directly by variations of resistance at an attenuated place in the line-wire, the effect of vibration at or near that point. Therefore my discovery is that the peculiar vibrations produced by articulate sounds may be transformed into corresponding undulations of an electrical current by the interposition in the circuit-conductor of two needles or pencils with their pointed ends in contact, as hereinafter set forth, and that the undulations so produced may be transformed into articulate sounds again by a proper instrument. Hence the apparatus of the ordinary electric lamp with its carbon pencils may, if properly adjusted and connected with a proper reproducer, constitute a practical telephone.

Having pointed out the general feature of my improvement, I will more particularly describe the method in which I have applied the same, without, however, proposing to limit myself to the details shown or hereinafter particularly described, having reference to the accompanying drawings, wherein—

Figure 1 is a perspective sketch, showing my apparatus in operative condition. Fig. 2 is a perspective view of my transmitter detached. Fig. 3 is a vertical longitudinal section of the same. Fig. 4 is an enlarged sectional elevation of the attenuated contact-points.

A is the battery. B is the line-wire. C is the ground-wire. D is my transmitter, and E is a receiver of any proper construction. F is an electroscope, used merely for the purpose of detecting the electrical flow. A simple electro-magnet is convenient and effective.

At some point in the line-wire I place a circuit-breaker composed of detached needles or pencils *e f*, one or both of which are sharp-pointed, so that when the circuit is closed by their contact the current will be forced to pass the resisting point of attenuation. When they recede from each other the circuit will be broken and all effect will cease.

To effect the proper adjustment suitable mechanism is required.

The undulations capable of reproducing audible sounds in articulate form require an exceedingly delicate adjustment of resistance, an adjustment corresponding to the delicate vibrations in a sonorous body responding to sound-waves. This delicate adjustment is easily obtained, while the the attenuated points *e f* are brought into contact with a certain pressure, to be determined by experimental adjustment of each instrument.

The pointed wires are therefore set in substantially rigid bases, one or both of which should be capable of sonorous vibration. Such a base is the plate *g*, which is rigidly mounted upon the post *h* and supported upon the base *i*. The vibration of the plate *g* is sonorous, and it is to be understood that the distinction between the sonorous vibration of a rigid body is alone herein referred to in contradistinction to that species of vibration which characterizes a membranous or thin metallic diaphragm.

The needle *e* is rigidly attached to the plate *g*, and the needle *f* is attached to an adjust-

able piston, *k*, which screws into the socket *m*, and may be adjusted therein at will by means of the worm-pinion *n* and tangent-screw *p*.

q and *r* are common binding-screws for attachment of the line-wire B.

The proper attachments having been made, words are spoken in the immediate vicinity of the plate *g*, and said plate is thereby caused to vibrate, and the pressure of contact between the points *e f* will be caused to fluctuate correspondingly and cause undulations of the passing electrical current. These undulations produce the well-known effect at the receiver E, but only become audible as articulate sounds when the pressure between *e f* assumes a certain tension, to be determined by experimental adjustment, as above stated.

Having described my invention, what I claim as new is—

1. In an acoustic telegraph, a receiver composed of attenuated points *e f*, set in substantially rigid bases and interposed in the line B, said points being in contact and subjected to a certain degree of pressure, as set forth, combined with a battery, A, and reproducer E, as set forth.

2. The rigid sonorous plate *g*, supported by a post, *h*, and provided with the pointed wire *e*, combined with the pointed wire *f*, adjustable in the solid base *i*, for the purpose set forth.

3. The rigid sonorous plate *g*, supported upon the post *h*, and the wires *e f*, pointed at their ends, combined with the piston *k*, screwed into the socket *m*, and the worm-pinion *n* and tangent-screw *p*, substantially as and for the purpose set forth.

4. The attenuated points *e f*, set in substantially rigid bases and interposed in the line of a conductor, for the purpose set forth, combined with mechanism whereby the required adjustment of said points may be secured at will.

JOHN H. IRWIN.

Witnesses:
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WILLIAM L. VOELKER.