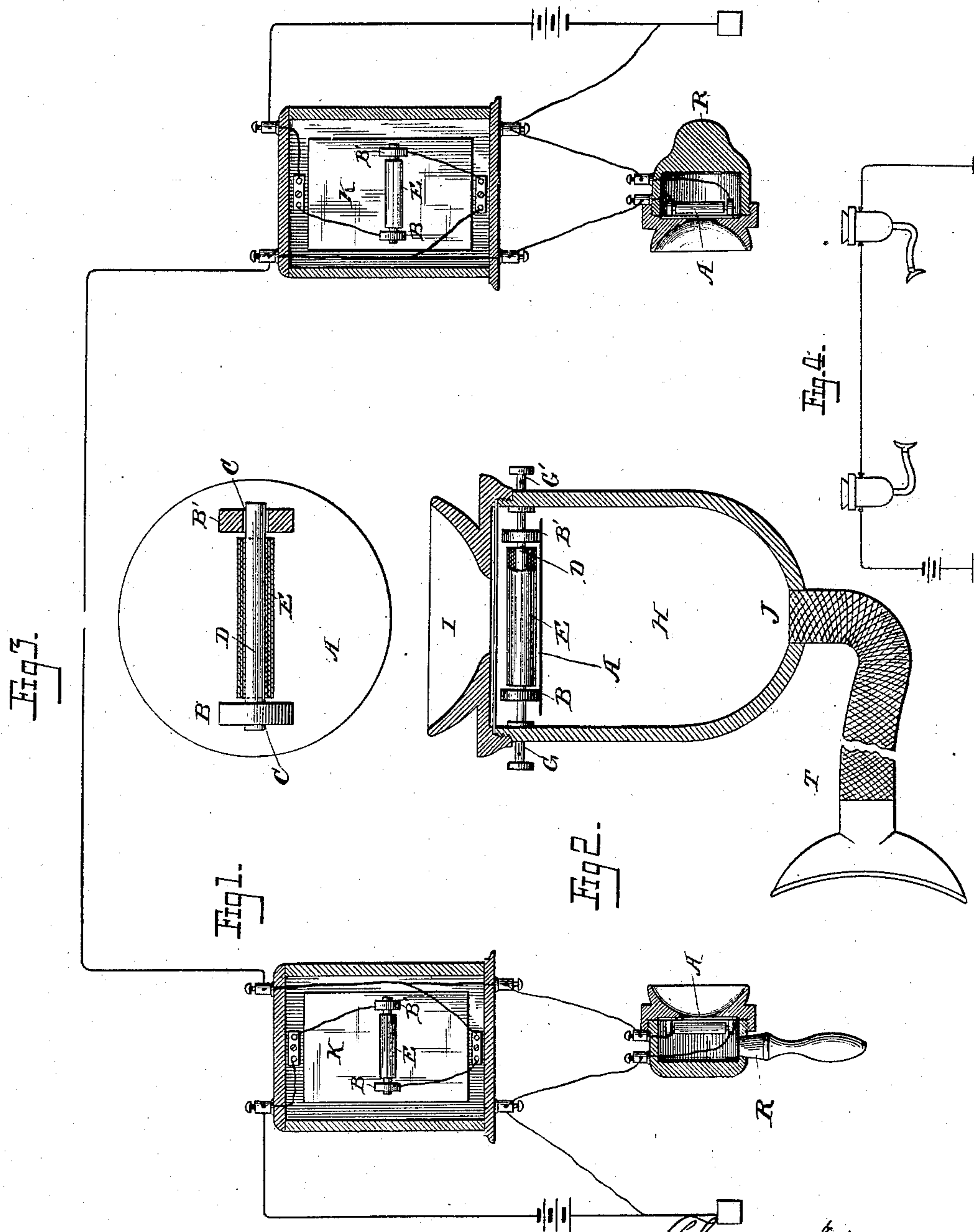


(No Model.)

T. WALLACE.
TELEPHONE.

No. 312,533.

Patented Feb. 17, 1885.



Attests:

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UNITED STATES PATENT OFFICE.

THOMAS WALLACE, OF NEW YORK, N. Y.

TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 312,533, dated February 17, 1885.

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To all whom it may concern:

Be it known that I, THOMAS WALLACE, a citizen of the United States, residing in the city, county, and State of New York, have invented certain new and useful Improvements in Telephones, of which the following is a specification.

The telephones heretofore constructed may be classified under the general heads of magnetic and electric or battery telephones.

The former or magnetic class have been generally used as receivers to translate the electrical variations passing over the line into air or sound vibrations such as are caused by the utterance of speech. In some instances their use as transmitters to translate the air or sound vibrations into electrical variations has been suggested, but they have been found to produce but feeble results, and their use as both transmitters and receivers has been abandoned.

The electric or battery telephone has been almost universally used as a transmitter, and whenever it becomes necessary to send messages any considerable distance the transmitter-instrument is included in the primary of an inductorium the secondary of which is included in the line-circuit. In this way the variations in the comparatively weak galvanic current have been transformed by the use of the inductorium into comparatively strong or intense secondary currents, which have been received and translated into speech by a magneto-receiver. This necessitates not only the use at each station of two separate telephonic instruments of different classes, each of which is more or less complicated and expensive, but also a local battery and an inductorium, which also add greatly to the expense, and are extremely liable to derangement and destruction. There are thus to be found in the ordinary telephonic line or system—as for the connection of two stations, for instance—two local batteries, two battery transmitting-instruments of greater or less complexity of construction, two magneto receiving-instruments, each consisting of a magnet-core, helix, and diaphragm, two expensive induction-coils, including the two primary and the line circuits and the necessary signaling-instruments, if used.

The object of my invention is to produce an

electric telephonic system embracing neither magnet cores or helices, local circuits, or induction-coils, and to use the same form of battery-telephone both as a transmitter and a receiver.

My invention is based, substantially, upon the discovery or invention of a battery-telephone that may be practically used, without change of construction or adjustment, either as a transmitting or a receiving telephone.

One of the earliest forms of speaking-telephones consisted of a standard having two projecting lugs of carbon, with a block or pencil of carbon having pointed ends fitting into recesses in the carbon lugs on the standard. This instrument, with various modifications and multiplications, has been used successfully as a transmitting-instrument, and I have found that by changing the construction of such instrument in a manner substantially as pointed out hereinafter, and connecting it up in line, as hereinafter indicated, it may not only be used as a transmitter, but as a successful receiver, and this without any of the usual adjuncts of a system, as heretofore pointed out, except a charged line; and I have further found that such an instrument requires no fine adjustment and regulation, but once constructed and set up is practically self regulating and adjusting, and equally adapted to operate both as a transmitter and receiver instrument.

I will now proceed to describe my invention with reference to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a plan view of the principal parts of a telephone embodying my invention. Fig. 2 is a section of another form of instrument. Fig. 3 is a diaphragm of a line or system for two stations, showing my invention, and disclosing still other forms of telephonic instruments embodying the same; and Fig. 4 is a diagram showing the use of one telephone as both the transmitting and receiving instrument at each station.

Similar letters of reference refer to like parts in all the figures.

To some sort of a resonant body, A, are connected or attached two studs, projections, or bearing-pieces, B B', of carbon or similar substance, having sockets or bearings C C' formed therein. Fitting into these sockets or bear-

ings, preferably somewhat loosely, is a bar, rod, or pencil, D, of carbon or its equivalent. Upon this bar of carbon is placed or fitted a weighted covering or casing, E, of some substance, preferably metallic—such as lead, platinum, or aluminium—in the form of foil or laminae, or otherwise.

I have found that the substance known as "tea-lead foil" is cheap, effective, and easily and readily applied, and I preferably use it, though of course other substances may be used that produce the same or similar results.

Such are the essential features of my instrument, and the details may be varied in many ways without departing from my invention.

In Fig. 1 the studs or projections B B' are represented as being mounted upon a disk-shaped sounding-board or resonator, which may be of any material preferred, and this may be used in any suitable or conveniently shaped case, as shown in the receiver R in Fig. 3.

In Fig. 2 the bearings B B' are shown as mounted upon studs G G', fixed to the sides of a cup-shaped resonating-case, H, having the usual mouth or ear piece, I, and having an opening, J, to which a tube, T, may be applied, so that the same instrument may be used as a receiver and transmitter without change of position.

In Fig. 3 the contact-pieces are shown as supported upon a rectangular plate, K, of wood or similar material, carried in a suitable frame having convenient binding-posts. From this it will be readily understood that it is immaterial to the essence of this part of my invention in what form or construction of case the contact-pieces may be carried, it only being necessary that some part thereof be of resonant material.

An instrument as thus constructed has been found to work practically as both a transmitter and receiver, and in Fig. 3 I have illustrated one manner of connecting such instruments up in a system or line, which will be readily understood by electricians. It will be seen that the galvanic circuit passes from one pole of the battery through the studs B B' and carbon rod D directly to line, the instrument intended to be used as a receiver being in a branch circuit around the transmitter and battery. Such an arrangement necessitates the use of a battery at each end of the line; but the receiving-instrument may be placed directly in the main circuit, as in the case where a single instrument is used both as a transmitter and a receiver, as indicated in Fig. 4. It will thus be seen that I produce a complete telephonic line or system without the use of any magnet or coils, local-battery circuits, or inductoriums, and that owing to the simple construction of instruments no fine adjustments are required.

I have found that I can use a relatively strong battery-current, and am thereby enabled to transmit speech over long distances, and this without the usual rattling often found in transmitters of this character, and that the disturbances attributed to induction, &c., are practically nullified.

I have also found that the instrument is very effective as a receiver when the bar or studs or both are composed of comparatively soft and porous carbon in contradistinction to hard compact carbon.

I am aware that the use of an instrument consisting of a diaphragm forming one electrode and having a pointed electrode bearing against its center has been suggested as both a transmitting and receiving instrument, and I make no claim to such construction.

Without limiting myself to any particular details of construction, what I claim is—

1. A telephone-instrument consisting of a resonant body, a bar of carbon supported in carbon-bearings, and a weighted covering or casing for said bar, substantially as described.

2. A telephonic receiver consisting of a weighted bar of carbon supported in carbon-bearings, in connection with a resonating body, substantially as described.

3. A combined transmitting and receiving telephone-instrument, consisting of a rod of carbon supported in carbon-bearings, in connection with a resonating body and suitable mouth and ear pieces, substantially as described.

4. A contact-piece for telephones, consisting of a bar or rod of carbon or similar low conducting material having a covering or casing of metallic foil, substantially as described.

5. A telephonic system or line embracing a galvanic circuit including two or more telephone-instruments, each consisting of a weighted carbon bar supported in bearings, in connection with a resonant body, and adapted to act both as a transmitter and receiver, whereby speech may be transmitted and received without the use of magnets, coils, or inductoriums, substantially as set forth.

6. The combination, with a charged line-circuit, of a transmitter consisting, essentially, of a carbon rod supported in carbon-bearings upon a resonant body arranged in the main galvanic circuit, and a receiver consisting of a similar carbon rod supported in carbon-bearings, and connected to a resonant body in a branch circuit around the transmitter, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

THOMAS WALLACE.

Witnesses:

F. L. FREEMAN,

WM. T. GRINNELL.