(No Model.)

T. J. PERRIN.

SPEAKING TELEPHONE TRANSMITTER.

No. 303,948. Patented Aug. 19, 1884.

Fig. 1.

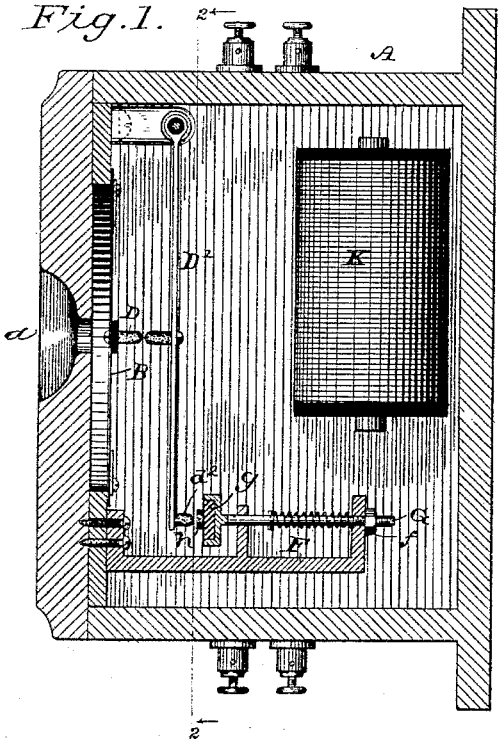


Fig. 2.

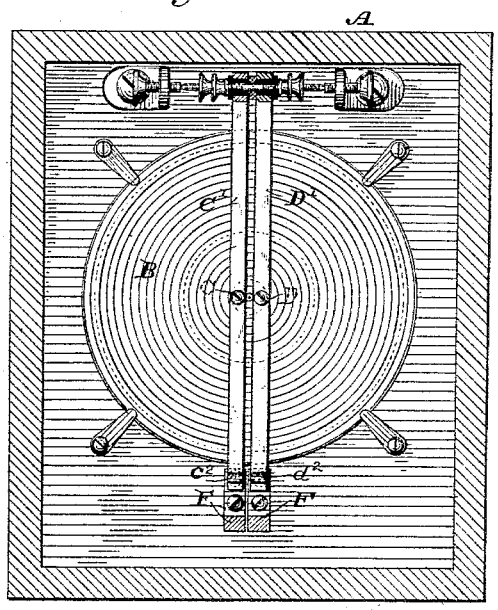


Fig. 4.

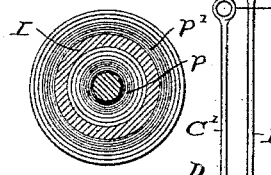
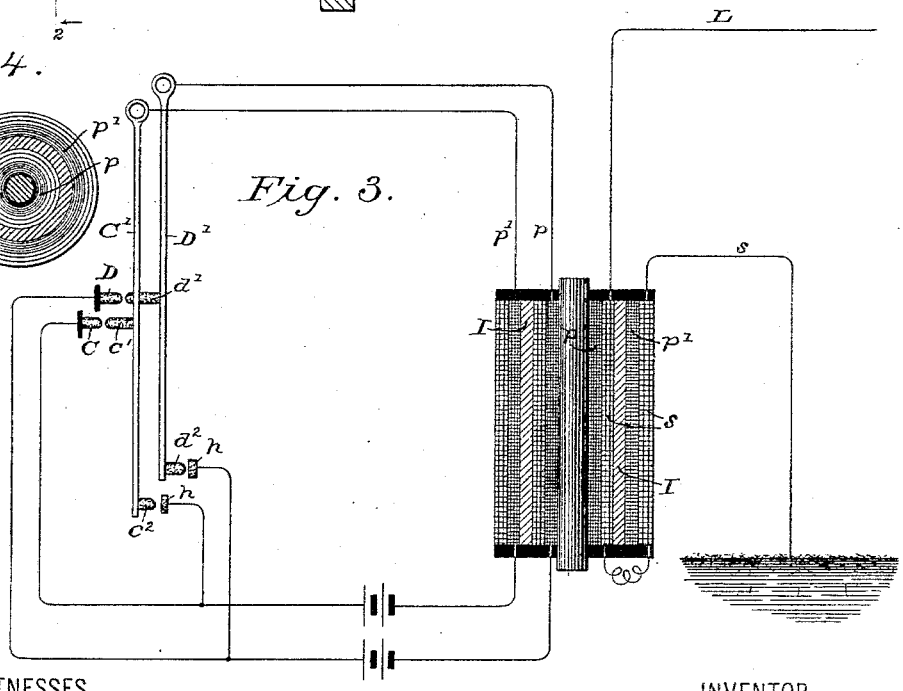


Fig. 3.



WITNESSES

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SPEAKING-TELEPHONE TRANSMITTER.

SPECIFICATION forming part of Letters Patent No. 303,948, dated August 19, 1884.

Application filed February 23, 1884. (No model.)

To all whom it may concern:

Be it known that I, THOMAS J. PERRIN, of the city, county, and State of New York, have invented certain new and useful Improvements in Speaking-Telephone Transmitters, of which the following is a specification.

My invention relates to the class of transmitters known as "contact-telephones," or those in which the resistance of a transmitting-circuit is varied to correspond to the sound-vibrations which actuate the transmitting-diaphragm.

The object of my invention is to improve the operation of such instruments by organizing them so that they work smoothly and without the rattle and jar which are incident to ordinary telephones of this kind when sounds of unusual loudness are uttered against the diaphragm. The improvements in construction by which this result is accomplished are fully set forth below.

In the accompanying drawings, Figure 1 is a transverse section through my improved instrument; Fig. 2, a sectional view of the same on the line 2 2 of Fig. 1, looking in the direction of the arrow; Fig. 3, a diagram view showing the principal parts of the apparatus and the circuit-connections, and Fig. 4 a transverse section through the induction-coil.

The casing A of the telephone, which is of any suitable and ordinary construction, and is provided with a hinged door formed with a mouth-piece, *a*, is provided with the ordinary binding-screws for the connection of the circuits, as illustrated in the diagram view, Fig. 3.

A transmitting-diaphragm, B, is secured in the door in any usual and ordinary way, and carries two insulated contact-buttons, C D—say of carbon or other suitable material. Suspended from suitable insulated bearings mounted in the upper part of the door of the instrument are two freely-swinging arms or levers, C′ D′. These levers carry contacts *c′ d′*, which correspond with and in operation are to rest in contact with the insulated contacts C D, carried by the diaphragm.

In the lower part of the case of the instrument brackets F are secured, each of which brackets, carries a spring-actuated rod or arm, G, which has its bearings in lugs on the bracket, and is normally pressed toward the end of the freely-swinging arm C′ or D′ by a suitable spiral spring, as illustrated. The position of these rods or plungers, however, relative to the ends of the arms C′ D′ is regulated by suitable nuts, *f*, or other devices. These arms or plungers G are enlarged at their ends and provided with sockets, in which an elastic insulating-cushion, *g*, is secured. Upon these cushions *g* carbon buttons *h* are mounted, so that they may be caused by the advancement of the plungers to bear against corresponding buttons, c^2 d^2, carried on the outer or rear sides of the ends of the arms C′ D′. Each of the swinging arms C′ D′, with their contacts C *c′* c^2 *h* and D *d′* d^2 *h*, is included in a separate primary circuit of an induction-coil, in the manner illustrated in the diagram view, Fig. 3, from which it will be seen that the arm C′ is connected with one end of the primary coil *p′* on one side of the local battery, while the contacts C *h*, which bear, respectively, against the contacts *c′* c^2, are connected with the opposite pole of the local battery.

By adjusting the plunger or rod G the contacts *h* c^2 *c′* C will be brought into proper contact, so that the vibrations of the diaphragm caused by sounds uttered into the mouth-piece will create variations of resistance in the primary circuit and induce the proper current in the secondary coil which goes to line, as usual. The other arm, D′, and its contacts are connected in exactly the same way with another primary circuit, *p*, of an induction-coil.

By employing the double contacts on the swinging arm C′ or D′, and by adjusting against the lower one so as to bring the upper one in proper contact with the button on the diaphragm, the buttons or electrodes are held in such relations to each other that they cannot separate or break contact, and no rattling or jarring is heard in the instrument when sounds of more than ordinary loudness are uttered in the mouth-piece. So far as this feature of my invention is concerned, it is obvious that I may use but one swinging arm C′ or D′ and

a single primary transmitting-circuit, as is usual. The second part of my invention, however, contemplates the use of two primary transmitting-circuits, which together simultaneously act upon a single secondary coil which goes to line in the ordinary way. I therefore employ two swinging arms C′ D′ and the circuit-connections described. Instead, however, of employing two independent induction-coils, as has heretofore been the case, I wind on the core alternate layers of the continuous secondary coil and the two primary inducing-coils. Thus next the core I wind a coil of the primary circuit *p*, and over that a layer or coil of the secondary circuit. Over these coils I now prefer to slip a soft-iron tube, I, and on that tube is wound a layer of the primary circuit *p′*, and on this layer is wound the final layer of the secondary circuit. The secondary circuit *s*, it will be perceived, runs from ground through its outer coil, through its inner coil, and then to line L. These windings and connections are fully illustrated in the diagram view, Fig. 3.

In Fig. 1, K is the induction-coil. In this figure and in Fig. 2, however, the circuit-connections have not been shown, as they would only be confusing, and are clearly and accurately illustrated in Fig. 3.

In my improved induction-coil both primary circuits *p* and *p′* act upon the secondary circuit with as much power as though two ordinary separate induction-coils were employed. My improved instrument, therefore, organized with double sets of transmitting-contacts and primary circuits, is very efficient for the transmission of articulate speech. It is sensitive and responds readily to all the tones and inflections of the human voice, and transmits equally well the low conversational tones of the voice or the louder tones which are uttered at the instrument by those inexperienced in its use.

I have set forth my invention in the form now best known to me, and one which is practical and efficient in operation. It is obvious, however, that the details of construction may be varied without departing from the invention.

No claim is herein made, broadly, to the use of a compound induction-coil and independent transmitting-circuits, as that constitutes the subject-matter of another application filed by me simultaneously herewith and serially numbered 121,419; nor is any claim herein made to the combination of two or more insulated contacts on a single diaphragm in connection with two or more independent primary circuits, as that is also covered in said application.

I claim as my invention—

1. The combination, substantially as set forth, of a transmitting-diaphragm, an electrode carried thereby, a hinged or swinging arm hanging in rear of the diaphragm, a second electrode or contact carried by said arm at some point between its ends, so as to rest in contact with the electrode on the diaphragm, a primary transmitting-circuit in which said electrodes are included, another pair of electrodes, one of which is carried on the swinging arm below and on the opposite side of the arm from the other electrode carried by it, above mentioned, and a branch of the transmitting-circuit in which said second pair of electrodes is included.

2. The combination, substantially as set forth, of a transmitting-diaphragm, an electrode carried thereby, a swinging arm hung in rear of the diaphragm, a second electrode carried by said arm so as to rest in contact with the electrode on the diaphragm, a primary transmitting-circuit in which said electrodes are included, another pair of electrodes, one of which is carried by said yielding arm in a different horizontal plane and on the opposite side from the other electrode carried by said arm, an adjustable support by which the other of said last pair of electrodes is carried, and means for adjusting said support to maintain the two pairs of electrodes in proper relation to each other.

3. The combination, substantially as set forth, of a diaphragm, two independent insulated electrodes mounted thereon, two independent insulated swinging arms or levers hanging in rear of the diaphragm, the electrodes or contacts carried by said hanging arms and corresponding with those carried by the diaphragm, two independent primary circuits, one for each pair of said electrodes, means for adjusting the contact of said electrodes, and a single secondary circuit which is acted on by both of said primary circuits.

In testimony whereof I have hereunto subscribed my name this 14th day of February, A. D. 1884.

THOS. J. PERRIN.

Witnesses:
E. H. QUANTIN,
J. CHARLES KUTZ.