(No Model.)

T. A. WATSON.

COMPOUND TELEPHONE.

No. 252,160. Patented Jan. 10, 1882.

Fig: 1.

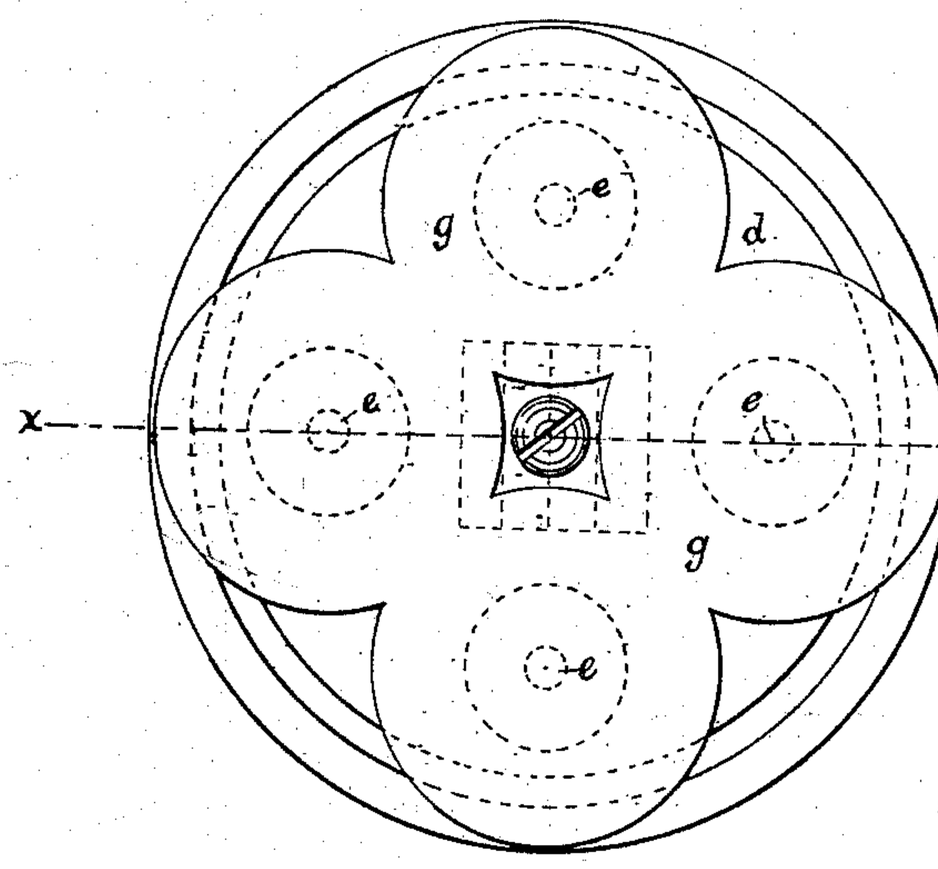


Fig: 4.

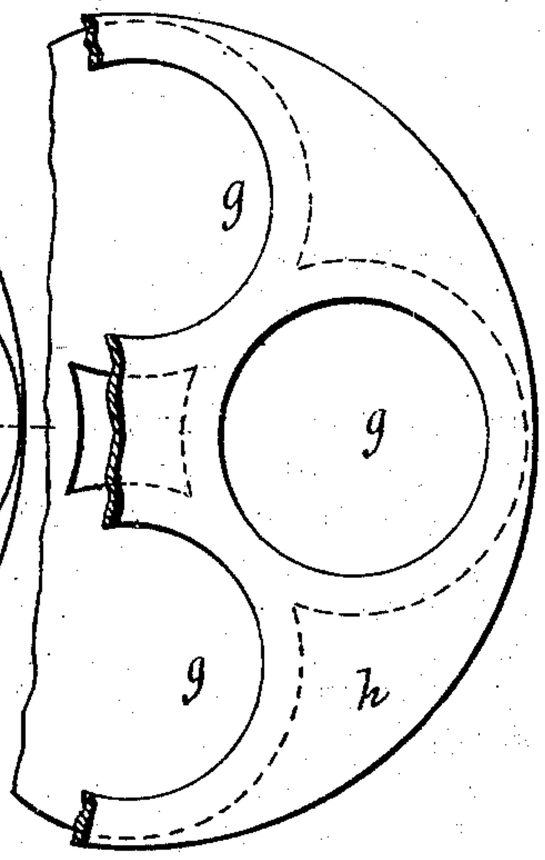


Fig: 2.

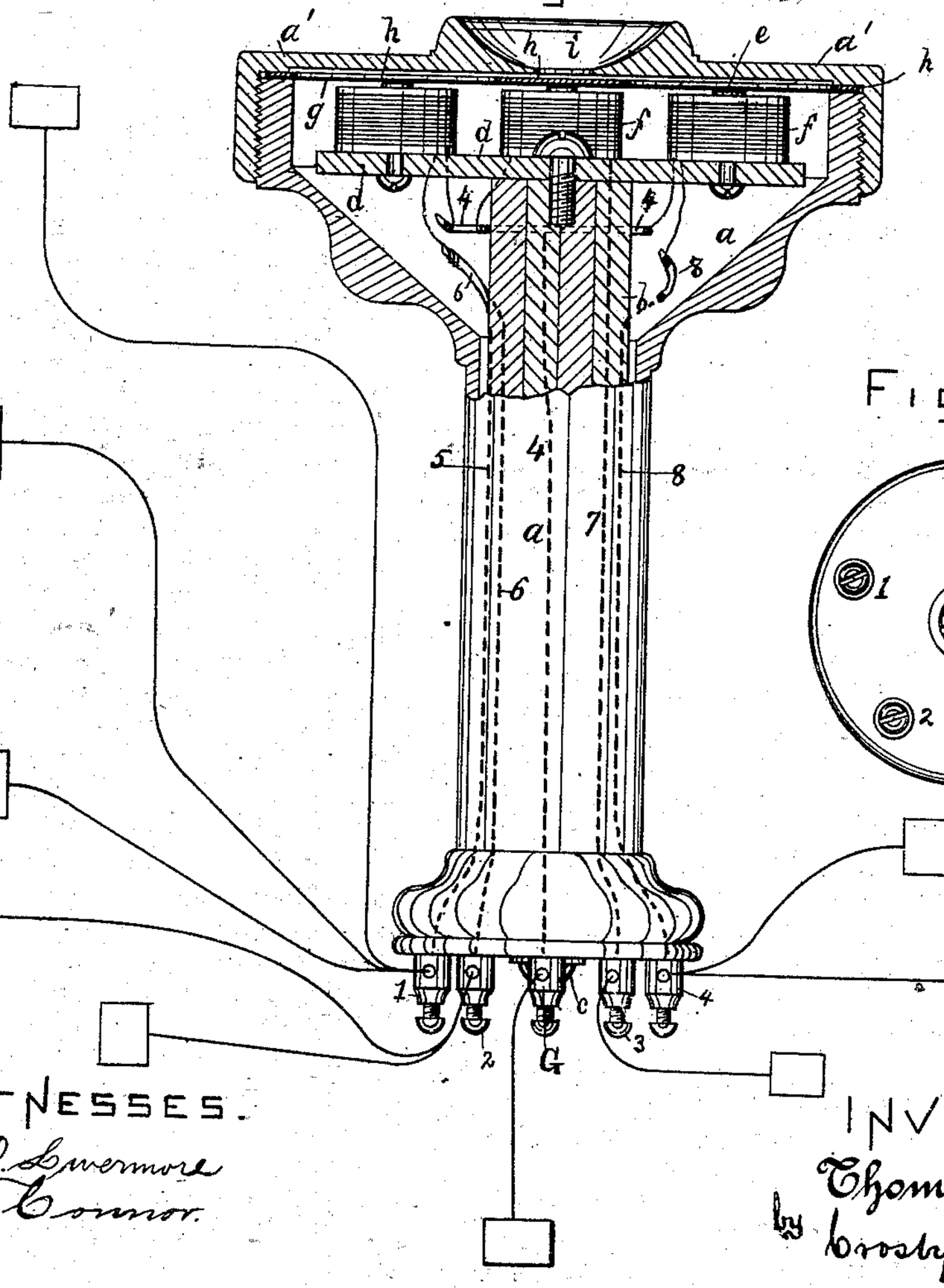
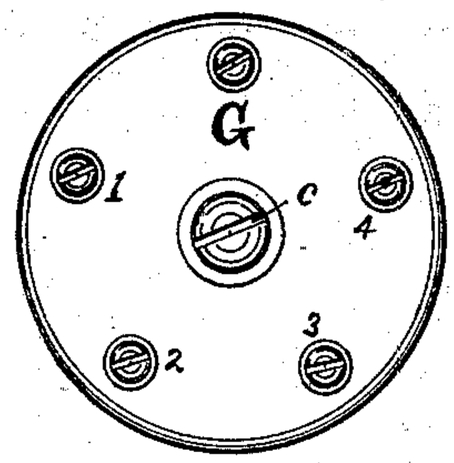


Fig: 3.



WITNESSES.

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UNITED STATES PATENT OFFICE.

THOMAS A. WATSON, OF EVERETT, ASSIGNOR TO THE AMERICAN BELL TELEPHONE COMPANY, OF BOSTON, MASSACHUSETTS.

COMPOUND TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 252,160, dated January 10, 1882.

Application filed April 29, 1880. (No model.)

To all whom it may concern:

Be it known that I, THOMAS A. WATSON, of Everett, county of Middlesex, State of Massachusetts, have invented an Improvement in Compound Telephone and Exchange Systems, of which the following description, in connection with the accompanying drawings, is a specification.

My invention relates to telephone-exchange systems, and has for its object to enable several closed telephonic circuits to pass through a single telephonic instrument independently of one another, so that a subscriber on any of the said circuits may directly communicate with an attendant at the said central instrument.

In another application filed with the present I have shown several circuits normally open, or of great resistance, uniting and passing through a central instrument of usual construction, and it was therein stated that it is impracticable to thus unite a large number of closed circuits of usual resistance, owing to the division of the currents among the said circuits. A small number—not more than ten or fifteen circuits—may center in a single instrument of usual construction. When a larger number is desired, as would usually be the case in central-office working, some expedient must be resorted to to prevent too great division of the currents.

My present invention consists in a compound telephone in which the different circuits intended to pass through the said telephone have independent helices or coils therein; or, if desired, a small number of circuits can conveniently pass through the same coils, the whole number being thus divided into groups, each having a separate and independent coil in the compound instrument.

As herein shown, a magneto-telephone with a single permanent magnet is provided with a pole-piece with several independent pole-projections, each provided with a helix or coil, one end of which is connected with one of the subscribers' circuits, and the other end of each of the said coils is connected to a common ground-wire. The different poles are each provided with a diaphragm, and the whole apparatus is inclosed in a case of the usual form, having a single mouth-piece common to all the diaphragms. The result of this arrangement is that when a subscriber on any circuit is communicating with the central attendant the effect on the coil and diaphragm of the compound instrument then in circuit is the same as in a single instrument of usual construction, as the other circuits passing through their own coils receive none of the direct currents from the subscriber speaking, but from the effects of induction and the transmission of sound from the one diaphragm to the others in the said compound instrument the sound will be heard on the other circuits centering in the said instrument, so that a subscriber by listening a moment after he has connected his telephone with the central one can tell whether the central operator is already engaged, and, if so, await his turn.

If desired, the different helices or coils might all be placed around a single core or pole-piece, in which case the inductive effect would be increased without materially diminishing the strength and effect of the inducing-currents. A novel pole-piece invented by me and forming the subject of another application filed with the present is well adapted to produce the proper effect in the induction-coils.

Figure 1 is a top view of a compound telephone with four independent poles and helices or coils, the mouth-piece and cover of the inclosing-case being removed; Fig. 2, a side view thereof, the upper part being shown in section on line *x x*, Fig. 1, and several of the circuits centering in the said instrument being shown in diagram; and Fig. 3, a view of the bottom thereof, showing the binding-screws for connecting the various circuit-wires. Fig. 4 is a partial plan, showing the divided diaphragm and the plate for holding it in place.

The case *a*, of usual construction, contains in the handle portion the magnet *b*, adjusted in the usual manner by the screw *c*, and provided at its upper end with a circular plate, *d*, of soft iron, to which the pole-pieces *e*, surrounded by the usual helices or coils, *f*, are attached.

As herein shown, the vibrating plate or diaphragm *g* has separate circular portions corresponding to the different pole-pieces *e*, each such portion being adapted to be vibrated in-

dependently of the others, and all being held rigid at their edges by a plate, *h*, perforated to correspond with the circular portions of the diaphragm, and itself held between the upper end of the case *a* and the cover *a'* thereof, screwed on in the usual manner, and provided with a mouth-piece, *i*, opening into a space above and common to all the vibrating surfaces *g*. When there is not a very large number of separate poles *e* a single diaphragm, supported only at its outer edges between the case *a* and cover *a'*, may be used, and it is also obvious that each separate circuit may be distributed upon all the poles *e*, in which case each spool *f* would contain a portion of several circuits, instead of each coil being confined to a single pole, as herein shown, such an arrangement heightening the inductive effect.

The method of grouping and connecting the circuit is indicated in connection with the compound telephone in Fig. 2. The said telephone has one more binding-screw than the number of independent coils *f*, one of the said binding-screws, G, being connected inside the case *a* by a wire, 4, with one end of each of the said coils *f*, the other ends thereof being separately connected each with one of the binding-screws 1 2 3 4 by wires, a portion of two of which (marked 6 7) is shown. The binding-screw G is connected with the ground, and the screws 1 2 3 4 with the respective circuits or groups of circuits, connected with the ground at their extremities and passing through the usual subscribers' stations. Three such circuits are shown in the group passing to the binding-screw 1. When a subscriber wishes to communicate with another he closes the circuit to the ground through his telephone and listens for a moment to hear whether the central operator is talking with another subscriber, and, if not, he immediately tells what is wanted, and the attendant listening at the compound telephone gives the proper direction to have the desired connection made, the different circuits being connected for intercommunication outside of and thus short-circuiting the coils in the compound telephone in any usual manner.

This invention has been herein described as embodied in a magneto-telephone; but it is obvious that it is equally applicable, at least in part, to a battery-transmitter in which a series of independent electrodes may be simultaneously operated by the same sound-waves received from a single sound-passage. For example, separate electrodes could be combined with each of the circular portions of the diaphragm, just as with the diaphragm of a transmitter of any ordinary or suitable construction. It is obvious that more than one sound-passage *i* may be used—as, for instance, one leading to each ear.

I claim—

1. The combination, with a telephone having two or more independent helices, of a series of independent circuits greater in number than said helices and divided into groups, each group being connected with one of said helices or coils, substantially as described.

2. In a compound telephone, two or more separate helices and cores attached to a base-plate and energized by a common permanent magnet, in combination with means, such as binding-posts, for connecting said helices in separate circuits, substantially as described.

3. The combination, in a compound telephone with two or more separate helices and cores, of a vibratory plate or diaphragm having portions adapted to vibrate independently, substantially as described.

4. The vibratory plate or diaphragm for a compound telephone, formed of a divided plate held in place, substantially as described, so that the portions are adapted to vibrate independently, as set forth.

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

THOMAS A. WATSON.

Witnesses:
JOS. P. LIVERMORE,
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