(No Model.)

G. K. & H. C. FARRINGTON.

MECHANICAL TELEPHONE.

No. 252,024. Patented Jan. 10, 1882.

Fig. 1.

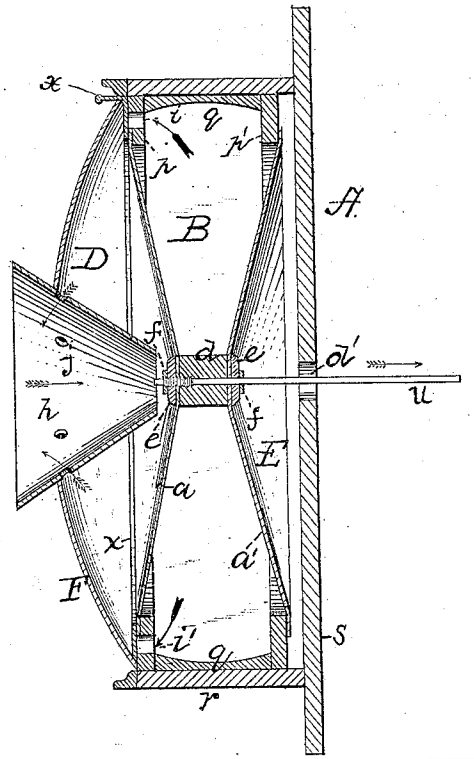
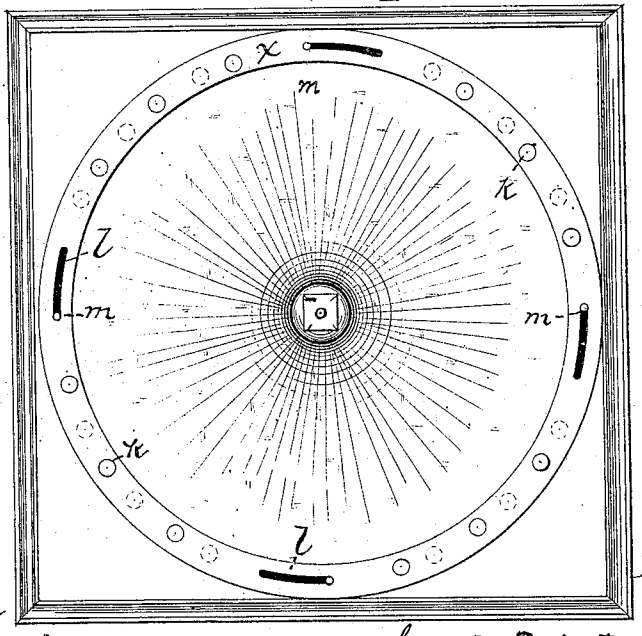


Fig. 2.



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UNITED STATES PATENT OFFICE.

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MECHANICAL TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 252,024, dated January 10, 1882.

Application filed September 14, 1881. (No model.)

To all whom it may concern:

Be it known that we, GEORGE K. FARRINGTON and HOMER C. FARRINGTON, citizens of the United States of America, residing at Kirksville, in the county of Adair and State of Missouri, have invented certain new and useful Improvements in Mechanical Telephones, of which the following is a specification, reference being had therein to the accompanying drawings.

Figure 1 is a vertical section of our improved telephone; Fig. 2, a front view of the same with the sound-collector and mouth-piece removed.

Like letters refer to like parts in each figure.

This invention relates to improvements in the class of telephones termed "mechanical," in which the transmission of a sound-wave or tone depends entirely upon the vibration of the sound-wave conducted by wire or other substance.

It is a well-established fact in physics that if two tuning-forks having the same pitch stand near each other and one be made to vibrate the other will vibrate also, giving forth the same note or tone, because it responds readily to corresponding wave-lengths in the air; but if they have a different pitch or are not in unison and are placed in the same position and one be made to vibrate the other will not respond, because it does not vibrate with the same wave as the air or sound wave that strikes upon it.

The object of our invention, therefore, is the construction of a telephone in which the diaphragms can be rendered uniform in pitch and vibration, and so arranged in position that the sound-wave, in its impact upon the diaphragms, is magnified or intensified in the transmitting and receiving instruments, thereby producing a clear and distinct repetition of sounds from one instrument to the other.

The nature of our invention will be herein described fully, and then pointed out in the claims.

In the annexed drawings, the letter A represents a suitable box or casing, having attached thereto the diaphragms *a a'*, which are drawn into a concavo-convex shape by means of the buttons *e e*, drawn together by screw-tap *f* on the conducting-wire *u*. These diaphragms are firmly secured at their outer rim or edge to the framing *p p'*, said framing being held in place by ends *r* and sides *s* of the box. The box, diaphragms, and frames form an air-chamber, B, and are provided with segmental blocks *q*, inserted above and below, to overcome sharp angles of corners to render the sound more smooth.

The letter D represents a sound-collecting chamber, formed by the curved cover F and the diaphragm *a*, with its framing *p*, in which is inserted a mouth-piece, *h*, having a number of holes, *j*, in its surface, opening into the sound-chamber, as shown, and through which air-vibrations are transmitted to the ear. The mouth-piece *h* converges with a hole over the button *e* on the diaphragm. There are also communicating openings *i i* from air-chamber B into sound-collector chamber D, said openings being opened or closed by a circular valve or plate, *x x*, having counter-openings therein, as shown at *k k k*, Fig. 2, which are brought over the holes *i i i* at pleasure by moving the valve by the knob or projection, the valve turning on pins *m m m m* in slots *l l l l*.

The letter E represents an air-chamber formed by diaphragm *a'*, and back of the box and sides *s s r r*.

The letters *d d'* represent corks or other insulating substances, through which the conducting-wire passes, and which serve to regulate the excessive vibration of the diaphragms and the twanging sound of the wire. The cork *d'* also closes the chamber E, rendering it a dead-air chamber, the same as B when the valves are closed.

The diaphragms are brought to the same degree of tension by the screw-top *f*, and being of the same size and texture and shape (concavo-convex) and on the same degree of tension, the vibration or impact of sound upon one is taken up by the other and transmitted by the conducting wire or cord to the other instrument.

In transmitting sounds the air-chamber B is closed, the air-chamber in the receiving-instrument being open, and vice versa. The air-chambers B and E both being closed when transmitting sounds and containing inert air, but subject to expansion and contraction by the impact of the sound-wave and alternation upon the diaphragms, the force or intensity of the

wave is increased or magnified to an extent that a whisper at one instrument is heard in a clear and audible whisper at the other, though a long distance may intervene between the two instruments connected by a wire or other conducting substance. The two telephones are brought in unison of vibration by using a straight conducting-wire between the same at a convenient distance and adjusting the diaphragms with the screw-tap until a clear and equal tone or wave length is received or given off by each.

The diaphragms are made of parchment, skin, or other suitable material, and have a vibrating surface seven or eight inches (more or less) in diameter each. Diaphragms, however, can be made of metal, animal, or vegetable substances.

The conducting-line may be made of copper, steel, or galvanized-iron wire, or hemp or linen cord.

Having thus described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a telephone, the double concavo-convex-shaped diaphragm, of the same size, material, and texture and degree of tension, in combination with the conducting-wire, buttons, adjusting screw-tap, and insulating-cork, substantially as described.

2. In a telephone, the combination of the diaphragms *a a'* and framing *p*, with openings *i*, forming the front and rear walls of an air-chamber, substantially as set forth.

3. In a telephone, the combination, with the diaphragms *a a'* and framing *p*, with openings *i*, of a valve-plate for opening or closing the openings in the framing *p*, substantially as and for the purpose set forth.

4. In a telephone, the combination of the chambers D, B, and E, formed by the casing A, diaphragms *a a'*, and curved cover F, substantially as shown and described.

5. In a telephone, the combination, with the curved cover F, diaphragm *a*, and transmitting-wire, of the mouth-piece *h*, with its inner open end registering over the button *e* of the transmitting-wire, and provided with a plurality of openings, *j*.

6. The combination, in a telephone, of the curved cover F, mouth-piece *h*, diaphragm *a*, perforated framing *p*, sliding valve *x*, diaphragm *a*, casing A, and transmitting-wire, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

GEORGE K. FARRINGTON.
HOMER C. FARRINGTON.

Witnesses:
CHARLES STILL,
HENRY W. ECKERT.