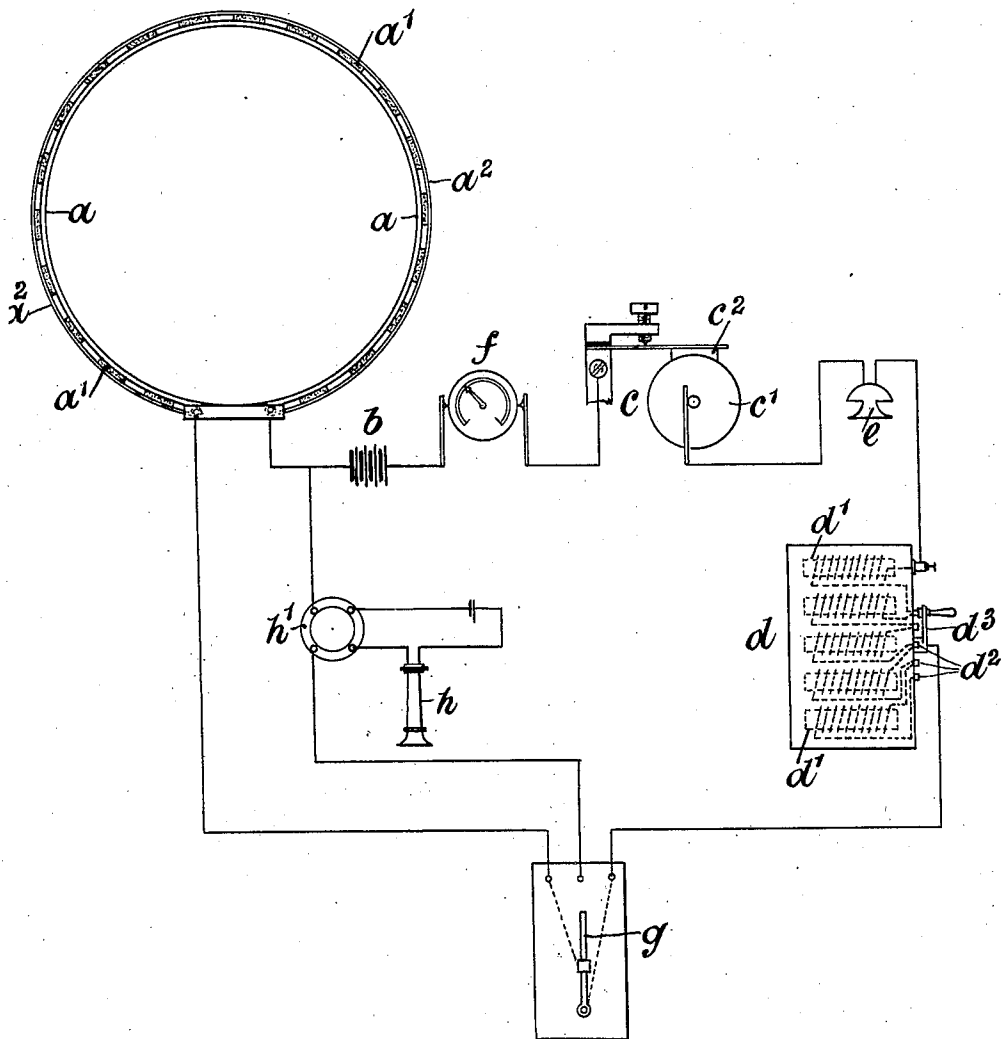


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 MEANS FOR EFFECTING TELEPHONIC COMMUNICATION WITHOUT CONNECTING WIRES.
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977,462.

Patented Dec. 6, 1910.



WITNESSES

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MEANS FOR EFFECTING TELEPHONIC COMMUNICATION WITHOUT CONNECTING-WIRES.

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Specification of Letters Patent.

Patented Dec. 6, 1910.

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To all whom it may concern:

Be it known that I, HARRY GRINDELL MATTHEWS, subject of the King of Great Britain, residing at Friezwood-Rudgeway, Thornbury R. S. O., Gloucester, England, have invented new and useful Improved Means for Effecting Telephonic Communication Without Connecting-Wires, of which the following is a specification.

This invention relates to improved means for effecting speech communication by means of emitting and receiving instruments without the aid of connecting wires, the installation being of a portable character.

The means for effecting the emission of the wirelessly conveyable electrically produced vibrations comprise a hollow frame which may be of any convenient shape, circular, square, oblong or other closed figure.

This frame is adapted to carry, distributed around its periphery, a plurality of bundles of wires which preferably are magnetized steel, the lengths of which are disposed in the direction perpendicular to the plane of the frame with like poles pointing all in one direction, the several bundles being electrically insulated from each other.

Around the frame is wound a continuous coil of many convolutions of insulated wire which may be wound within or may be wound outside the before-mentioned bundles of wire. Arrangements are made whereby, when it is desired to send a message, there can be switched into circuit with the said coil, a battery or accumulator, a telephone transmitter, a known device to be presently described, whereby the battery current is rendered intermittent to an extremely high degree of frequency without definite periodicity, an ammeter and a reinforcing device to be presently described and, alternatively, the battery, transmitter, &c., can be switched out of the circuit, and a telephone receiver and relay switched into the circuit with the said coil when it is desired that a message be received. Preparatory to receiving the message, the circuit may be made to include an aural, visual or other attention directing device arranged to be invoked by a relay battery. Alternatively the attention calling device may consist of a telephone receiver adapted to emit a sound audible at some distance.

The known intermitter of excessively high

frequency comprises a pair of surfaces which are caused to travel relatively to one another at a comparatively low velocity, the electric current being required to pass from one surface to the other. The character of the surfaces is such as to normally interpose a resistance to the passage of the electric current, and it is also such that the frictional contact of the rubbing surfaces causes a momentary breakdown of resistance, the resulting passage of an electric impulse re-constituting the resistance. This effect occurring at a multiplicity of points causes the electric flow to be intermittent with such a high degree of frequency and with such an indefiniteness of periodicity that the voice waves produced in the telephone transmitter are able to initiate by means of the frame, wirelessly conveyable vibrations possessing the same voice character.

The periphery of a disk of aluminium and a steel shoe which fits the periphery, constitute a pair of surfaces which is adapted to effect the high frequency intermittence above described.

The reinforcing device above referred to, which is included in the transmitting circuit, consists of a plurality of coils of insulated wires wound on bundles of iron wire, arrangements being made whereby a greater or less number of such coils can, with facility be switched into the circuit. These may consist of a plurality of coils surrounding a single bundle of wires common to them all or, alternatively, each coil may be separately furnished with a core of wires.

On the accompanying drawing is shown an arrangement of the above described elements whereby speech can be transmitted to or alternately received from a distance as desired without the use of interconnecting wires.

In this drawing, a is a frame of portable dimensions which performs the function of the so called aerial of ordinary wireless systems of telephony. Around the periphery of this frame are secured a plurality of bundles $a^1 \dots a^1$ of steel wires which have been magnetized and placed with like poles pointing all in one direction, such direction being perpendicular to the central plane of the frame a and, in using the contrivance, the frame is so situated that the perpendicular to the central plane thereof is

pointed as nearly as can be ascertained in the direction of the station with which communication is desired.

Around the frame an insulated wire a^2 is wound a plurality of times, the coil being within or without the bundles of wires. This coil forms a portion of the circuit of the transmitter, when a message is being sent or, alternatively, a portion of the receiving circuit on the reception of a message.

In the transmitting circuit is included a source of electric energy b , which may conveniently be an accumulator.

At c is shown a high frequency interrupter of the character above described, consisting for example of a disk of aluminium c^1 so mounted and so actuated that it undergoes slow rotation by clock-work, electro-motive power or otherwise. In light adjustable contact with the periphery of the disk is a shoe c^2 .

The electric impulses transmitted are required to cross some point of the space which intervenes between the shoe c^2 and the disk c^1 , that point being situated anywhere on the more or less contacting surfaces of c^1 and c^2 .

At d is a reinforcer consisting of a plurality of wire coils $d^1 \dots d^1$ wound on bundles of iron wires, the coils being so interconnected to one another and to the contacts $d^2 \dots d^2$ that by shifting the switch arm d^3 any number of the coils may be included in the circuit as desired.

At e is a microphone or telephonic transmitter adapted to receive speech and translate it into corresponding electric impulses.

An ammeter f is shown included in or associated with the transmitting circuit.

The circuit is completed through a key or switch g when pressed. Alternatively, when the key is not pressed the accumulator b and the above described transmitting instruments $c d e f$ are cut out of the circuit of the wire a^2 wound around the frame a and the circuit around the latter is completed through the winding of a telephone receiver h , this latter being supplemented by a relay of ordinary construction h^1 .

I claim:

1. For emitting and receiving electrically produced vibrations conveyable therefrom or thereto in a wireless manner, a frame, comprising a plurality of bundles of wires of magnetizable material secured around the periphery of the frame with the lengths of the wires placed in a direction at right angles to the central plane of the frame, a wire wound around said frame and means for transmitting electric impulses of a signaling character through the said wire.

2. For emitting and receiving electrically produced vibrations conveyable therefrom or thereto in a wireless manner, a frame, comprising a plurality of bundles of mag-

netized steel wires secured around the periphery of the frame with the lengths of the wires placed in a direction at right angles to the central plane of the frame, a wire wound around said frame and means for transmitting electric impulses of a signaling character through the said wire.

3. An emitter of wirelessly conveyable vibrations comprising a frame having secured around the periphery thereof a plurality of bundles of wires and having a conducting wire wound around said frame, a source of electric energy, a telephone transmitter and a high frequency interrupter in circuit with the said frame-wound wire.

4. An emitter of wirelessly conveyable vibrations comprising a frame having secured around the periphery thereof a plurality of bundles of magnetized steel wires and having a conducting wire wound around said frame, a source of electric energy, a telephone transmitter and a high frequency interrupter in circuit with the said frame-wound wire.

5. An emitter of wirelessly conveyable vibrations comprising a frame having secured around the periphery thereof a plurality of bundles of magnetized steel wires and having a conducting wire wound around said frame, a source of electric energy, a telephone transmitter and a high frequency non-periodic interrupter in circuit with the said frame-wound wire, said interrupter comprising a pair of surfaces in moving contact, the nature of which is such as to interpose a resistance to the cross-flow of electricity, which resistance breaks down by the relative movement of the surfaces and is renewed by the passage of electricity.

6. An emitter of wirelessly-conveyable vibrations, comprising a frame, a plurality of bundles of magnetized steel wires secured to the periphery of the frame with their lengths in a direction at right angles to the plane of the frame, a conducting wire wound around said frame and in circuit therewith, a source of electric energy, telephone transmitter, a high frequency interrupter, and a plurality of coils, embracing bundles of iron wires.

7. A telephonic installation for wirelessly conveyed intercommunication, comprising a pair of frames situated in approximately parallel planes, a plurality of bundles of wires of magnetizable material secured to each frame, a conducting wire wound around each frame, a source of electricity, a telephone transmitter and a high frequency transmitter in circuit with the wire of one frame and a telephone receiver with the wire of the other frame.

8. A telephonic installation for wirelessly conveyed intercommunication, comprising a pair of frames situated in approximately parallel planes, a plurality of bundles of

wires of magnetizable material secured to each frame, a conducting wire wound around each frame, and in association with each frame a combination of a source of electricity, a telephone transmitter and a high-frequency interrupter and also a telephone receiver and in addition a switch adapted to place either the transmitting combination or

the receiving telephone in circuit with the frame-wound conducting wire.

In witness whereof I have hereunto set my hand in presence of two witnesses.

H. GRINDELL MATTHEWS.

Witnesses:

R. WILLIAMS,

H. D. JAMESON.