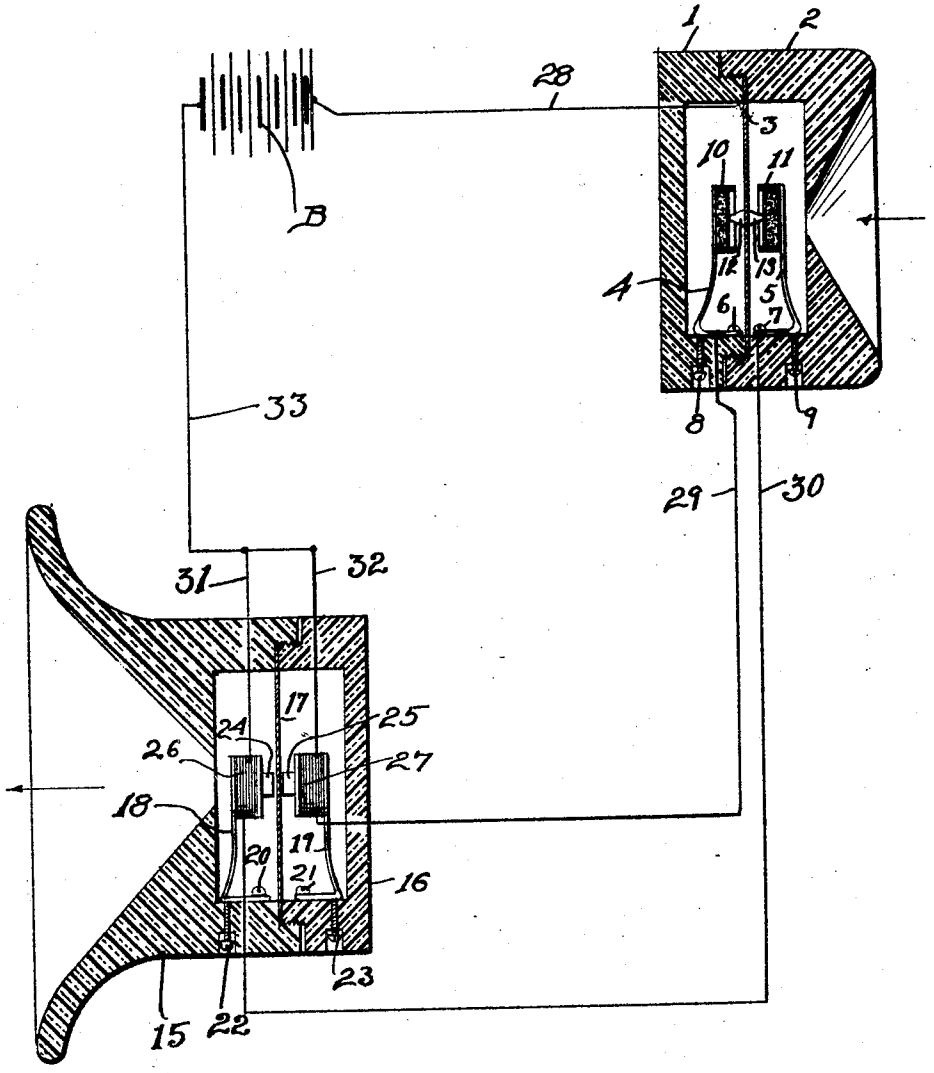
Dec. 8, 1925. 1,564,290

S. F. SMITH

TELEPHONE APPARATUS

Filed May 8, 1922



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UNITED STATES PATENT OFFICE.

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TELEPHONE APPARATUS.

Application filed May 8, 1922. Serial No. 559,158.

To all whom it may concern:

Be it known that I, STUART F. SMITH, a citizen of the United States, residing at San Francisco, in the county of San Francisco, State of California, have invented a new and useful Telephone Apparatus, of which the following is a specification in such full and clear terms as will enable those skilled in the art to construct and use the same.

This invention relates to telephony and its object is to provide means whereby the diaphragm movements of the receiving apparatus may be more accurately vibrated with respect to the movements of the sending diaphragm and in as great amplitude as may be desired, whereby a loud speaking effect may be more readily produced.

An object of the invention is to provide means whereby the current applied to the receiving apparatus or the sending apparatus will be applied to opposite sides of the receiving diaphragm, the pulses of current being increased and diminished by the movements of the sending diaphragm.

The drawing is a sectional view of the transmitter and receiving apparatus with the battery and wiring system illustrated diagrammatically.

The sending apparatus consists of a flat cylindrical back 1 to which is secured the mouthpiece 2, the two parts being secured together by threads in a well known manner, and having a shoulder to secure the diaphragm 3 in a fixed position.

Light springs 4 and 5 are secured within the two sending members by means of screws 6 and 7, and the position of these springs may be adjusted by means of screws 8 and 9. The springs 4 and 5 carry any well known type of microphone transmitting apparatus as indicated at 10 and 11, which transmission apparatus is in turn operated by small projections 12 and 13 secured to the diaphragm 3.

The receiving apparatus consists of the earpiece 15 and cylindrical back 16 which is secured to the earpiece by threads in the usual manner. The back secures the diaphragm 17 between it and the earpiece similar to the way the diaphragm is held in the case of the sending apparatus.

Within the earpiece and its back are two spring members 18 and 19, which members are secured in place respectively by the screws 20 and 21. Other screws 22, 23 serve to adjust the position of the members 18 and 19. The members 18 and 19 carry an armature as indicated at 24, 25. These armatures are wound with suitable wire to produce electromagnets 26, 27.

The current for the apparatus is supplied from the battery B, and is taken from a single wire 28 to the diaphragm 3. From the diaphragm it is delivered by means of the points 12 and 13 to the mircrophone transmitters 10 and 11, and from them through the wires 29, 30 to the electromagnets 26, 27, the arrangement being such that the impulses produced at the back of the diaphragm 3 will be applied as impulses to the diaphragm 17 by the electromagnet at the back of that diaphragm, and similarly the impulses transmitted from the front of the diaphragm 3 will be transmitted to the electromagnet 26. Wires 31, 32 extend from the magnets 26, 27 to a wire 33 leading to the battery.

In operation, impulses given to the diaphragm 3 will cause currents to vary through the back and front microphone transmitters 10 and 11, and similarly the currents produced will be applied to the electromagnets 26, 27 correspondingly in back and front of the diaphragm receiving apparatus. With this apparatus it is easily possible to produce a very loud speaking telephone because the impulses of the diaphragm may be greatly increased since it is positively operated in both directions, that is, a heavy current on one side of the diaphragm 3 will produce a light current on the opposite side, and the same effect will take place on both sides of the diaphragm 17. In the case of the ordinary apparatus with the microphone transmitter on one side only of the diaphragm, weak currents on one side of the diaphragm will produce weak currents on the same side of the receiving diaphragm with the result that there is practically no tendency to operate the diaphragm out of the plane of its normal position of rest, save in one direction and that toward the particular magnet used.

What I claim is as follows, but various modifications may be made in the construction shown in the drawing and above particularly described form, within the purview of my invention:

1. In a telephone apparatus sending and receiving diaphragms, microphone transmitting apparatus on both sides of the sending diaphragm, a pair of electromagnets on op-

posite sides of the receiving diaphragm, means to transmit current from both sides of the sending diaphragm to both sides of the receiving diaphragm, and means to adjust the position of the sending apparatus with respect to the diaphragm adjacent the same.

2. In a telephone apparatus a sending and a receiving diaphragm, microphone transmitting apparatus on both sides of the sending diaphragm, electromagnets on both sides of the receiving diaphragm, means to transmit current from both sides of the sending diaphragm to both sides of the receiving diaphragm, means to adjust the position of the microphone apparatus with respect to the sending diaphragm, and means to adjust the position of the electromagnets with respect to the receiving diaphragm.

3. In a telephone apparatus sending and receiving diaphragms, microphone transmitting apparatus on both sides of the sending diaphragm, electromagnets on both sides of the receiving diaphragm, circuits for transmitting current from the microphone apparatus on both sides of the sending diaphragm to the electromagnets on both sides of the receiving diaphragm, and a single current source for supplying the sending and receiving apparatus with current.

4. In a telephone apparatus the combination with a sending diaphragm and a receiving diaphragm of means on both sides of each of said diaphragms to mutually cooperate electrically to effect transmission of sounds, and a source of electric current for supplying the apparatus with electric current whereby the receiving diaphragm is operated by the electrical apparatus on both sides thereof.

In testimony whereof I have hereunto set my hand this 28th day of April A. D. 1922.

STUART F. SMITH.