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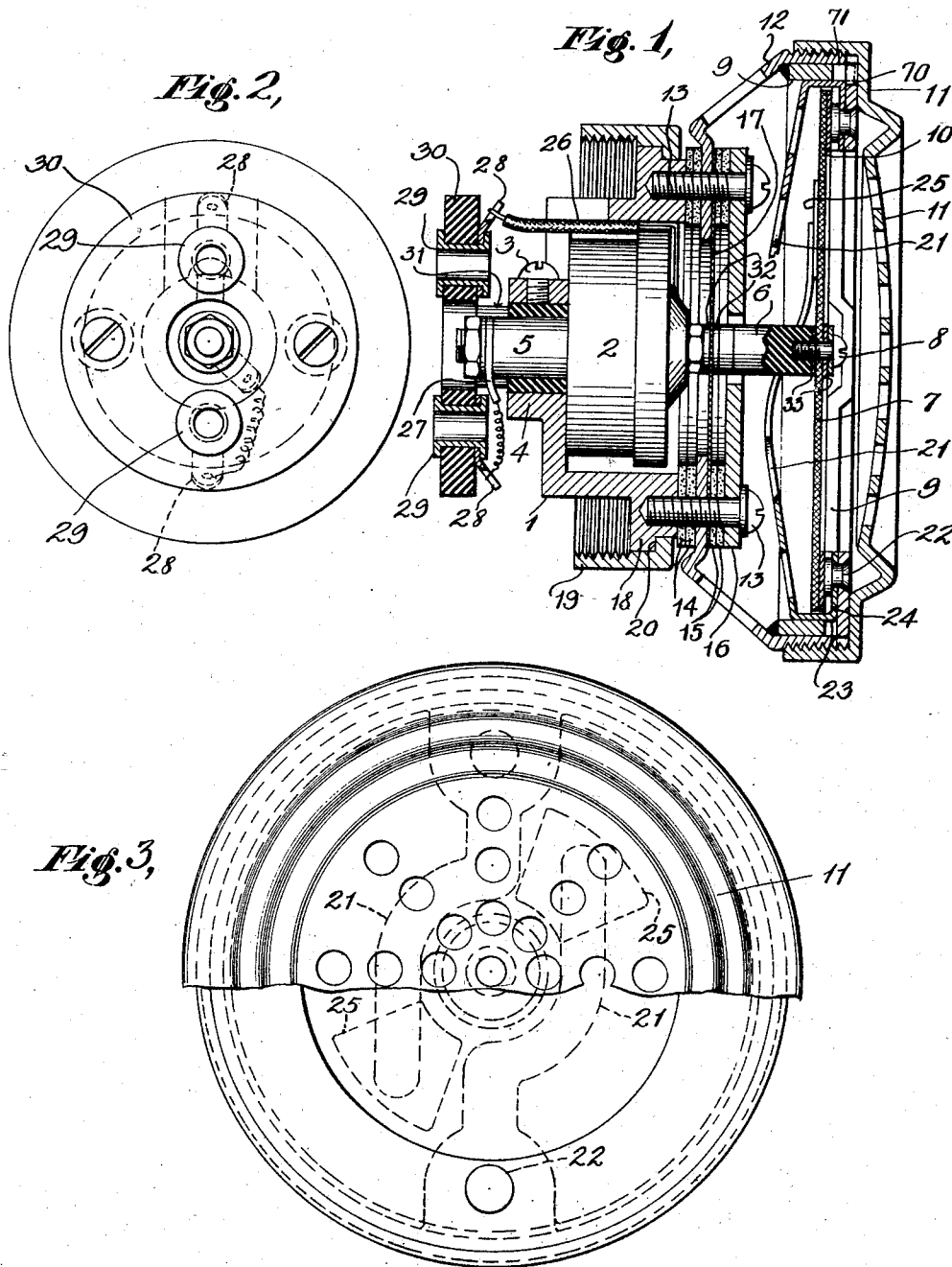
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1,777,924

TELEPHONE APPLIANCE

Filed Jan. 4, 1928

2 Sheets-Sheet 1



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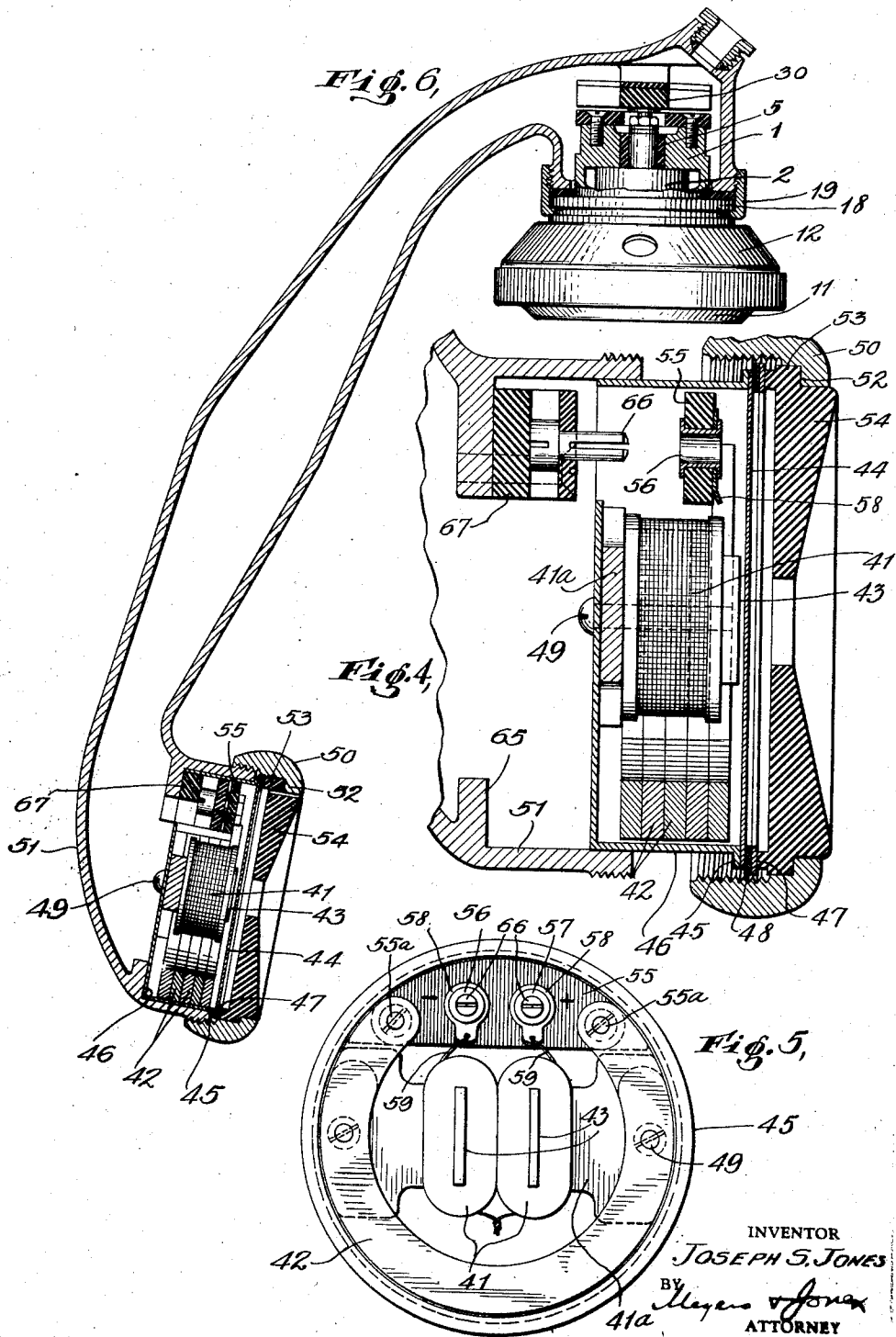
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UNITED STATES PATENT OFFICE

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TELEPHONE APPLIANCE

Application filed January 4, 1928. Serial No. 244,412.

This invention is an improvement in telephone appliances, and more particularly in transmitter and receiver units.

One of the primary objects of the present invention is the provision of a unit of transmitter or receiver type, capable of being easily and readily removed from a hand set without the necessity for tools.

Another object is the provision in such a unit of electrical connections completed by the use of stab contacts, in which the contacts in the hand set are stationary.

Another object is the provision in a transmitter unit, of means to maintain the carbon cup water tight, and for maintaining the movable electrode of the carbon cup in a like condition.

Another object is the provision of means for enabling lateral adjustment of the carbon cup with respect to the balanced diaphragm, and for damping the period of vibration thereof.

With these and other objects in view the invention consists in the construction and novel combination of parts fully described hereinafter, illustrated in the accompanying drawings, and pointed out in the claims appended hereto, it being understood that various changes in the form, proportion, size and minor details of construction within the scope of the claims, may be resorted to without departing from the spirit of the invention.

In the drawings forming a part hereof:—
Fig. 1 is an axial section of a unit of the transmitter type.

Fig. 2 is a rear elevation of the unit with the mouthpiece and associated parts removed.

Fig. 3 is a front elevation, with a part of the mouthpiece broken away.

Fig. 4 is an axial section of the receiver unit.

Fig. 5 is a rear view with the clamping ring detached.

Fig. 6 is an axial section of a transmitter and a receiver unit in connection with a common handle casing of the continental type.

In the embodiment of the transmitter unit shown in Figs. 1 to 4 inclusive, the unit includes a bridge 1, in which is arranged a

transmitter button 2, the button being held in place by a set screw 3, which passes through the hub of the bridge, and engages an insulating sleeve between the hub and the fixed electrode 5 of the button.

The button is of a usual type, and the connector 6 of insulating material, such as a phenolic condensation product, is extended forwardly to a connection with the diaphragm 7, connection being made by means of a screw 8. The diaphragm has the usual support 9 and an insulating ring of varnished cambric indicated at 10 is arranged between the diaphragm and the support.

The mouthpiece 11 of brass has a threaded connection with the perforated plate 12 also of brass, which is secured to the bridge 1 by means of screws 13, gaskets 14 and 15 of rubber being arranged between the bridge and the perforate plate, and between the plate and a holding plate 16. A gasket 17 of oiled silk is arranged between the plate 12 and the gaskets 15.

As shown in Fig. 1, the bridge has an annular external flange 18 at the end adjacent to the diaphragm, and the screws 13 have threaded engagement with openings in the flange. An inwardly flanged clamping ring 19 engages the flange, the flange being rabbeted as shown at 20 to receive the flange of the ring, and the ring is internally threaded as shown to engage the receiver casing.

A plurality of damping springs 21 is provided in connection with the diaphragm. These springs are secured to the diaphragm support as indicated at 22, and they are of the shape shown in Fig. 3, in dotted lines, each bearing on the inner face of the diaphragm at the opposite side of the connector 6 from the connected end of the spring. As shown in Fig. 1, each spring has an angular bend 23 at its outer end, extending transverse of the diaphragm, and with a lug 24 parallel with the diaphragm, and lapping upon the diaphragm support and secured thereto by the connections 22. Each spring is bowed inwardly from the diaphragm as shown, and is curved to pass around the connector. The free end of each spring, that is the end which engages the diaphragm, has

secured thereto a damping pad 25, preferably of empire cloth (.007).

The terminal leads 26 and 27 of the transmitter button are connected with radial lugs or washers 28 on bushings 29, which are inset in a socket 30, the ends of the bushings being flanged as shown to hold the bushings in place, and to clamp the washers between the flanges and the socket plate. The lugs on the washers as shown in Fig. 2, have openings through which the terminal leads are passed and connected in the usual manner. The socket plate is supported by the sleeve 4, being connected therewith by extensions 31, from the sleeve as shown, and both socket plate and sleeve are of insulating material. The bridge and the clamping ring are preferably of brass.

It will be apparent from the description and the drawing, that the entire unit may be removed from the hand set, merely by unthreading the clamp ring 19 from the set casing, whatever the character of the casing. The unit is equally serviceable and applicable, in hand sets, wall telephones, desk telephones, and in fact any kind of telephone. The bushings 29 are of brass, and are engaged by fixed resilient stab contacts in the hand set, which fit into the bushings, establishing connection.

The chamber within the bridge, in which the transmitter button is supported is rendered watertight by the oiled silk diaphragm 17 before mentioned, which is clamped at its outer edge between the perforated plate and the gaskets. The movable electrode of the carbon cup passes through a perforation at the center of the diaphragm, and the diaphragm is clamped at this point between two insulating washers indicated at 32.

The diaphragm 7 is a floating diaphragm of aluminum or like suitable material, held between the support 9 and the springs 21, and annular rings of varnished cambric. Washers 33 of suitable material, such as empire cloth (.007) are arranged on opposite sides of the diaphragm, between the head of the screw 8 and the connector 6. The springs 21 also act to damp the period of vibration of the diaphragm, and they engage it at angular intervals of 180°.

The receiver unit is like the transmitter unit, in that it can be connected to and disconnected from the receiver casing without the use of tools, merely by unscrewing a clamping ring, as in the transmitter unit. Referring to Fig. 4, it will be seen that the receiver unit includes the usual coils 41, field magnet 42, cores 43, and diaphragm 44. The diaphragm is held between the flange 45 of a case 46, and a ring 47 of brass or the like, a gasket 48 being interposed between the ring and the diaphragm.

The case is also of brass, and it is substantially cup shaped as shown, the magnets being carried in a manner to be described. The

ring 47 before mentioned is held clamped upon the diaphragm by a clamping ring 50, which is internally threaded to engage the receiver casing, such as the common handle casing indicated at 51 in Fig. 6. The clamping ring has an internal flange 52 overlying a rib 53 on the ear-piece 54 of hard rubber or the like. The ring 50 is of brass, and by its compression on the gasket 47 makes a watertight container for the magnets.

Terminal sleeves 56 and 57 are carried by a bakelite plate member 55, this plate being carried by the end laminated bar of the permanent magnet, and fastened thereto by screws 55^a as shown in Fig. 5. The magnets are carried by a cross bar 41^a, and the cross bar is connected to the case by screws 49. The casing has its bottom cut away, to provide an opening through which the plug holder or plate member 55 may pass, and the terminal sleeves 56 and 57 are designed to receive spur or stab contacts 66 carried by the hand set casing, as for instance the casing 51. The contacts are supported by an insulating block 67 secured to the casing.

It will be apparent that in each case the unit is a unitary structure, capable of removal and replacement as a whole, merely by releasing the clamping ring. It will also be apparent that the improved units are adapted for connection with any type of support, either a wall or desk telephone or the combination holder shown in Fig. 6. In this figure, the transmitter unit is mounted in one end, and the receiver unit is mounted in the other.

It will be apparent from inspection of Fig. 4, that when the unit is inserted in the casing 51, the stab contacts will engage the sleeves 56 and 57 when the clamping ring 50 is tightened on the casing 51. Each bushing carries a washer 58, having a radial lug, and lead wires 59 connect the lugs of the respective washers to the terminals of the coils. It will be noticed referring to Fig. 4, that the end of the casing 51 is shaped to receive the casing 46 in a rabbet or enlargement, indicated at 65, and when the clamping ring is screwed home, the unit is firmly held in the receiver.

The adjustment of the carbon button with respect to the diaphragm is enabled by means of the set screw 3. After the diaphragm has been secured to the element 6, by means of the screw 8, the button is properly adjusted, with the set screw 3 loose, and when the adjustment is made the set screw is tightened.

A pin lock is provided for the diaphragm support. This lock includes a pin 70 on the support, which engages within a notch or recess 71 in the edge of the element 12. When the mouthpiece 11 is partially released from the element 12, the pin 70 may be released from the slot 71, by outward movement with respect to the element 12. When the mouth-

piece is screwed home, the pin is locked in the recess.

What is claimed as new is:—

1. In combination with a holder, a telephone unit including a casing in which the unit is mounted, the holder having a socket in which the unit casing fits, means in connection with the unit to detachably connect the unit to the holder, substantially rigid radially resilient stab contacts in connection with the holder, and bushings supported by the unit for engagement by the contacts.

2. A telephone unit, including a casing in which the unit is mounted, and having an internally threaded clamping ring for engagement with a support for the unit, the unit having sleeve contacts for engaging substantially rigid radially resilient spur contacts in connection with the support.

3. In combination with a hand set casing, a telephone unit including a casing in which the unit is mounted, the set casing having means to limit the inward movement of the unit, and a clamping ring having threaded engagement with the set casing for clamping the unit in place, the hand set casing and the unit casing having means interengaged by the insertion of the unit casing for providing electrical connections.

4. A telephone unit of the transmitter type, including a bridge having means rotatable with respect thereto to threadedly engage a hand set, a floating diaphragm supported by the bridge, means in connection with the bridge for limiting outward movement of the diaphragm and engaging the edge thereof, and spring members connected with the supporting means for the diaphragm at the periphery of the diaphragm, each having a damping pad engaging the diaphragm near the opposite side from the connection of the spring member with the supporting means.

5. A telephone unit of the transmitter type, including an enclosing casing for the unit, a floating diaphragm supported within the casing, said casing having an annular shoulder against which the diaphragm bears, and spring members having damping pads engaging the diaphragm to hold it against the shoulder.

6. A telephone unit of the transmitter type, including an enclosing casing having at one side a floating diaphragm and at the other side a transmitter button, the movable electrode thereof being connected with the diaphragm, a water tight seal between the diaphragm and the button, and a water tight seal between the diaphragm and the casing.

7. A telephone unit of the transmitter type, including an enclosing casing having at one side a diaphragm carrying a connector, and a carbon cup having a movable electrode cooperating with the connector, means for mounting the carbon cup within the cas-

ing, for enabling movement toward and from the diaphragm, and means in connection therewith to fix the cup in adjusted position.

8. In combination with a holder, a telephone unit including a casing in which the unit is mounted, the holder having a socket in which the unit casing fits, means in connection with the unit to detachably connect it to the holder, and detachable electrical connections between the unit and the holder interengaged by the insertion of the unit into the socket.

9. A telephone unit including a bridge for connection with a casing for the unit, and a clamping ring for detachably engaging the casing, a floating diaphragm, a support for the diaphragm, and a water-tight seal at the end of the bridge between the diaphragm support and the interior of the bridge.

10. A telephone unit including a bridge for connection with a casing for the unit, and a clamping ring for detachably engaging the casing, a floating diaphragm, a support for the diaphragm, and a water-tight seal at the end of the bridge between the diaphragm support and the interior of the bridge, said seal being constituted by an oil silk diaphragm held transversely of the end of the bridge adjacent to the floating diaphragm.

Signed at New York city, in the county of New York and State of New York this 29th day of December, A. D. 1927.

JOSEPH S. JONES.