

April 18, 1950

J. F. DALTON
HAND TELEPHONE

2,504,307

Filed Aug. 24, 1945

2 Sheets-Sheet 1

FIG. 1

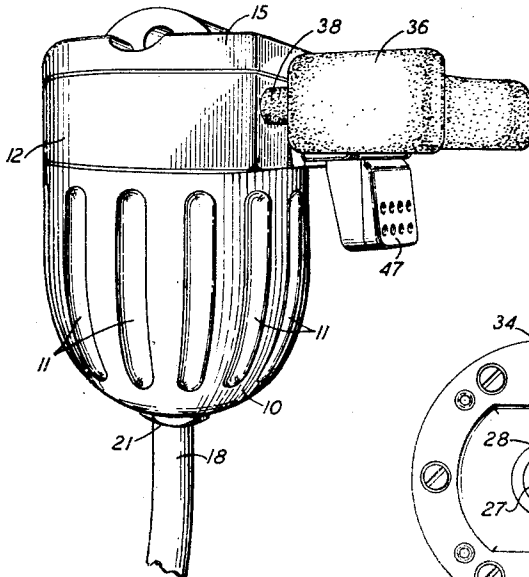


FIG. 2

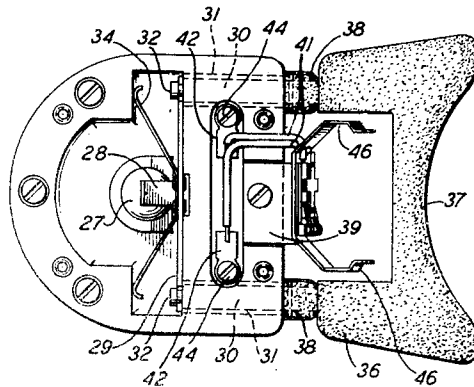
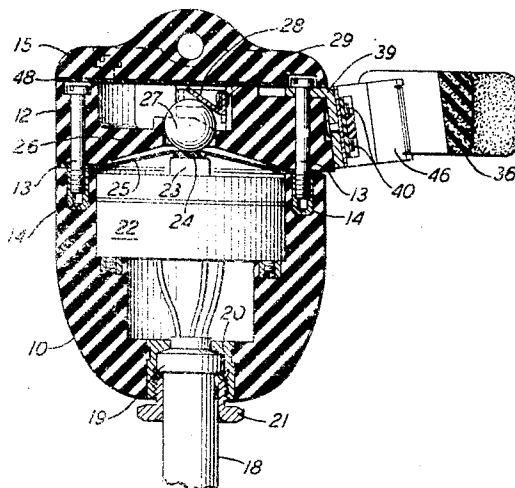


FIG. 3



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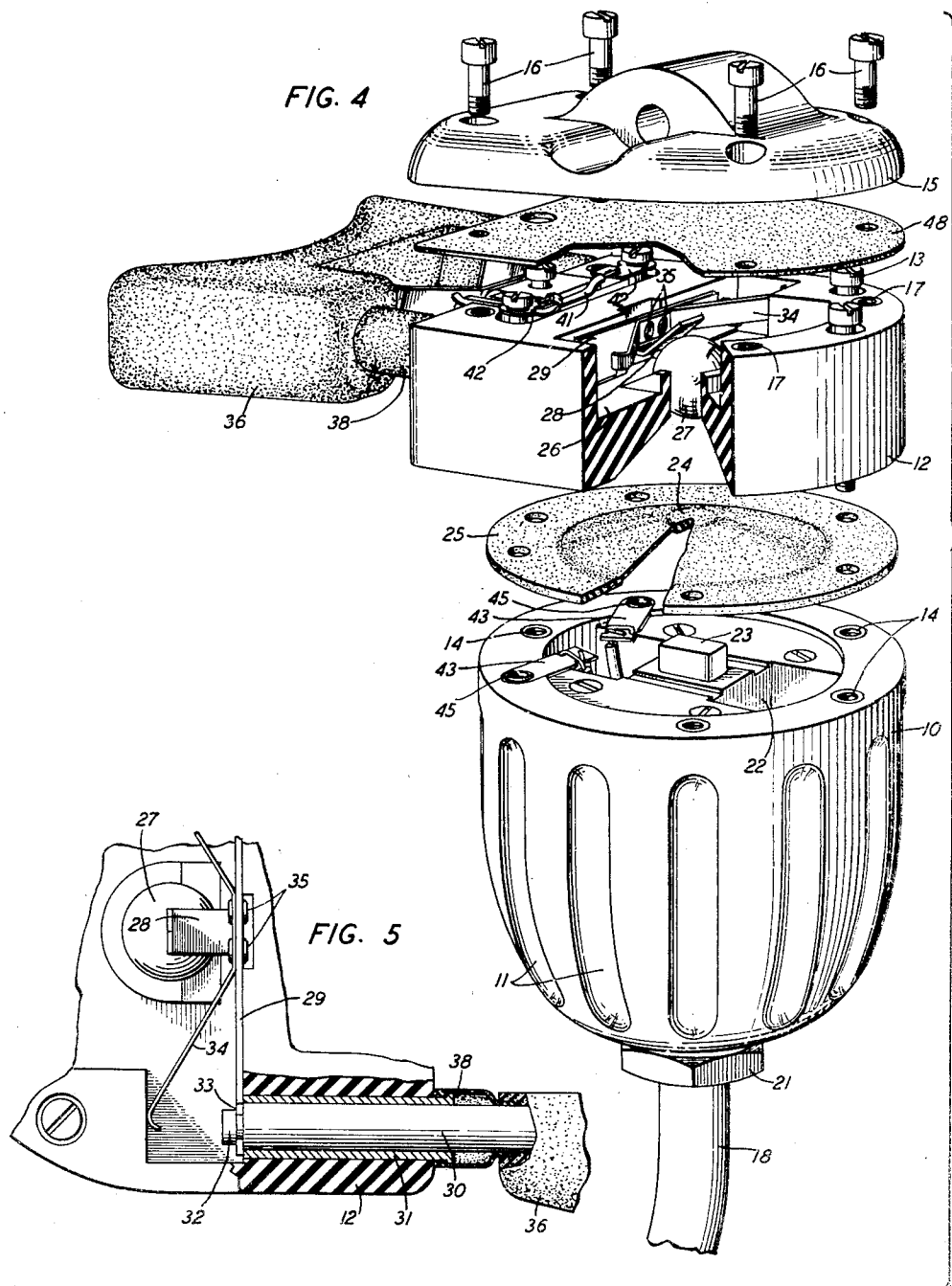
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HAND TELEPHONE

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9 Claims. (Cl. 179-158)

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This invention relates to hand telephones and more particularly to microphones including a circuit controlling element for operatively associating the microphone with a telephone circuit.

One object of this invention is to facilitate the use of hand telephones and more specifically to enable ready operation of the circuit controlling element in microphones including such an element.

Another object of this invention is to assure comfortable use of hand held microphones including a circuit controlling element.

A further object of this invention is to increase the operating life of hand telephones used in locations, such as on ships and in tropical areas, where adverse moisture conditions are encountered.

In one illustrative embodiment of this invention, a hand telephone comprises a handle or housing having a switch therein and a microphone mounted upon the handle or housing and associated electrically with the switch to be connected in or disconnected from a telephone circuit by operation of the switch.

In accordance with one feature of this invention, a mechanical control system is provided for the switch, including an actuating member adapted to be engaged by the upper lip of the face of the user of the telephone and the microphone is positioned upon the handle or housing so that when the actuating member is placed against the upper lip the microphone is located automatically in proximity to the mouth of the user.

In accordance with another feature of this invention, the actuating member comprises a bridge piece having a surface contoured to conform substantially to the upper lip of the user, the bridge piece being coupled to the actuating or operating element of the switch by a substantially frictionless linkage, whereby the switch may be operated by slight pressure upon the bridge piece and such pressure is distributed over a substantial area of the upper lip of the user.

In accordance with a further feature of this invention, the coupling between the bridge piece and the switch is constructed and arranged so that locking or failure of this coupling by non-uniform pressure distribution over the bridge piece is prevented.

In accordance with still another feature of this invention, means are provided for preventing entrance of moisture into the handle or housing, as by way of the coupling between the bridge piece and the housing.

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The invention and the above noted and other features thereof will be understood more clearly and fully from the following detailed description with reference to the accompanying drawing in which:

Fig. 1 is a perspective view of a hand telephone illustrative of one embodiment of this invention;

Fig. 2 is a top view of the hand telephone shown in Fig. 1, with the cover of the housing removed;

Fig. 3 is an elevational view mainly in section of the telephone;

Fig. 4 is an exploded perspective view of the telephone, portions being broken away to show details; and

Fig. 5 is an enlarged fragmentary view, partly in section, showing details of the actuating system for the switch.

Referring now to the drawing, the hand telephone therein illustrated comprises a handle or housing, for example molded of insulating material such as a phenolic condensation product, having a cup-shaped portion 10 provided with flutes 11 in its outer surface, an intermediate portion 12 affixed to the portion 10 by screws 13 threaded into tapped inserts 14 embedded in the portion 10, and a cover 15 secured to the intermediate portion by screws 16 threaded into tapped inserts 17 embedded in the intermediate portion.

Extending from the base of the cup-shaped portion 10 is a multiconductor cord 18 having thereon a soft rubber collar 19 which is compressed between cooperating locking nuts 20 and 21 to form a moisture-proof seal between the cord and the housing, the nut 20 being embedded in the housing portion 10.

Mounted within the housing portion 10 is a switch 22 having an actuating member 23. The switch is of conventional construction and of the type wherein the contacts thereof are closed when the actuating member 23 is depressed and are opened when the actuating member is released.

The actuating member 23 engages the central thickened portion 24 of a resilient diaphragm 25, advantageously of soft rubber, the thickened periphery of which is clamped between the intermediate and cup-shaped portions 12 and 10 respectively, of the housing and forms a moisture-tight seal therebetween. Seated upon the portion 24 of the diaphragm 25 and positioned within a central aperture in the wall 26 of the intermediate housing portion 12 is a spherical ball or bearing 27 which is engaged by an inclined rigid finger 28 mounted by a bar 29. The bar 29

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is coupled at its ends to a pair of parallel drive pins 30 fitted slidably in sleeves or bearings 31 embedded in the intermediate portion 12 of the housing. The coupling between the bar and pins is loose and constituted by headed studs 32 upon the rods which pass through oversized apertures 33 in the bar so that some play between the bar and rods and toggle-like action of the coupling is permitted whereby seizure between the pins and the bearings therefor is prevented and motion of the bar results from longitudinal displacement of either pin.

The bar 29 normally is forced against an inner wall of the intermediate housing portion 12 by a spring 34 affixed to the bar, as by rivets 35, so that the finger 28 loosely engages the ball 27 and is in the position relative thereto illustrated in the drawing, whereby the actuating member 23 is released. The drive pins are secured at their outer ends to a bridge member 36 the surface 37 of which is contoured to conform substantially to the upper lip of the user of the hand telephone. In order to prevent entrance of moisture into the housing through the sleeves or bearings 31, soft rubber sleeves 38 affixed, as by cementing, to the pins 30 and sleeves 31 are provided. As shown clearly in Fig. 5, the sleeves or bearings 31 project beyond the face of the housing portion 12 adjacent thereto and, thus, serve as stops to limit motion of the bridge member 36 toward the housing.

Mounted upon the housing portion 12 and opposite the bridge member 36 is a bent support member 39 which carries a pair of terminals 40 insulated from each other and the support member. As shown in Figs. 2 and 4, terminals 40 are connected by tie wires 41 to tabs 42 which are connected electrically to respective tabs 43 by screws 44 threaded into eyelets 45 embedded in the housing portion 10 and locking the tabs 43 thereto. Also mounted upon the housing portion 12 is a resilient member having fingers 46 adapted to grasp a microphone 47 therebetween. The microphone, which advantageously is of the noise cancellation type, is provided with contacts, not shown, for engaging the terminals 40. The electrical connections are such that when the switch 22 is operated, the microphone circuit is closed.

A moisture-proof closure 48, for example of soft rubber, is clamped between the cover 15 and housing portion 12 and forms a moisture-tight seal therebetween.

In use of the hand telephone, the surface 37 of the bridge member 36 is placed against the upper lip of the user whereby the microphone 47 automatically is positioned opposite the mouth of the user. The bridge member is pressed against the lip so that the finger piece 28 rides over the ball or bearing 27 and the latter is moved to depress the actuating member 23 for the switch 22, whereby the microphone circuit is completed. Upon release of pressure against the bridge member, this member moves outward to a point near the end of its travel whereupon the actuating member is released and this circuit is opened. Because of the ball or bearing 27 and finger piece 28 association, and also the loose coupling between the bar 29 and drive pins 30, but very little resistance in addition to that afforded by the spring 34, is afforded to operation of the switch so that the switch can be held operated by very little pressure upon the bridge member 36 and comfortable use of the telephone is assured. Similarly, because of the very small frictional resistance provided by the actuating system, the spring 34 is effective to

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assure positive opening of the microphone circuit when the bridge member 36 is moved away from the lip of the user of the telephone. Moreover, the motion of the upper lip in speaking is slight so that the bridge member when actuated to effect closing of the microphone circuit does not substantially interfere with or impede normal speaking of the user of the telephone nor materially affect the intelligibility of the speech picked up by the microphone. Small motions of the bridge member will not effect operation of the switch 22 so that false operation during use is prevented.

It will be appreciated that not only is the switch housed in a moisture-tight enclosure but also the elements, such as the ball or bearing 27 and spring 34, within the housing portion 12 and the connections between the microphone and the switch, excepting the terminals 40 which are readily cleaned, are protected against moisture. Thus, the hand telephone is capable of long use in exposed situations, such as on ships or in tropical areas, where adverse moisture conditions are encountered.

Although a specific embodiment of this invention has been shown and described, it will be understood that it is but illustrative and that various modifications may be made therein without departing from the scope and spirit of this invention as defined in the appended claims.

What is claimed is:

1. A hand telephone comprising a housing, a switch within said housing and having an actuating member, a pair of drive pins extending slidably through a wall of said housing, a bridge member coupled to said pins outside of said housing, means mechanically linking said pins to said actuating member for operating said member in response to motion of said pins into or out of said housing, and a microphone mounted by said housing and positioned adjacent said bridge member so that when said bridge member is placed against the upper lip of the user of the telephone said microphone is opposite the mouth of the user.

2. A hand telephone in accordance with claim 1 comprising means defining with said housing a moisture-proof enclosure for said switch, and means defining a moisture-proof seal between said wall and said drive pins.

3. A hand telephone in accordance with claim 1 comprising means including a diaphragm constituting a part of said linking means defining with said housing a moisture-proof enclosure for said switch.

4. In a hand telephone, a housing having a first hollow portion open at one end, a switch within said portion and having a reciprocable actuating member opposite said one end, a diaphragm extending over said end and having a portion engaging said actuating member, said housing having a second hollow portion seated upon said diaphragm, a freely rotatable member seated upon said diaphragm portion and mounted by said second housing portion for free displacement in the direction of reciprocation of said actuating member, a drive pin extending slidably through a wall of said second housing portion and at an angle to said direction, and an inclined finger piece coupled to said pin and engaging said rotatable member.

5. In a hand telephone, the combination defined in claim 4 comprising resilient means defining a moisture-tight seal between said pin and said second wall portion, and means including said diaphragm and said second housing portion

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defining a moisture-tight enclosure for said rotatable member and said finger piece.

6. In a hand telephone, a housing having a cup-shaped portion, a switch within said portion and having a reciprocable actuating member adjacent the open end thereof, a resilient member overlying said open end and having a portion engaging said actuating member, said housing having a second portion overlying said resilient member and provided with an aperture opposite said diaphragm portion, a spherical member within said aperture and seated against said portion of said resilient member, and means including a member extending through a wall of said second housing portion and reciprocable at an angle to the direction of reciprocation of said actuating member for depressing said spherical member thereby to operate said actuating member.

7. In a hand telephone, a housing having a cup-shaped portion, a switch within said portion and having a reciprocable actuating member adjacent the open end thereof, a resilient member overlying said open end and having a portion engaging said actuating member, said housing having a second portion overlying said resilient member and provided with an aperture opposite said portion of said resilient member, a spherical member within said aperture and seated against said portion of said resilient member, a pair of substantially parallel drive pins extending slidably through a wall of said second housing portion and at substantially right angles to the direction in which said actuating member is reciprocable, and a finger piece engaging said spherical member, coupled to said drive pins and inclined with respect to said direction.

8. In a hand telephone, the combination defined in claim 7 wherein said resilient member is a moisture-tight diaphragm and which comprises means defining with said second housing portion and said diaphragm a moisture-tight enclosure

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for said spherical member and finger piece, said means including resilient members affixed to said drive pins and forming moisture-tight seals therebetween and said second housing portion.

9. A hand telephone comprising a housing, a switch within said housing and having an actuating member reciprocable parallel to the axis of said housing, a resilient diaphragm within said housing and having a portion in engagement with said actuating member, said housing having a transverse wall therein provided with an aperture adjacent said diaphragm portion, a ball bearing within said aperture and seated upon said diaphragm portion, a finger piece engaging said bearing and inclined with respect to said axis, a bar coupled to said finger piece and mounted within said housing for motion normal to said axis to force said finger piece over said bearing, drive pins extending slidably through a wall of said housing, substantially normal to said axis and coupled to said bar for actuating it, a bridge piece external to said housing and joining said drive pins, said bridge piece having a surface contoured to conform substantially to the upper lip of the user of the telephone, and a microphone mounted by said housing adjacent said bridge piece to be opposite the mouth of the user when said bridge piece is placed against the upper lip.

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