

Nov. 3, 1959

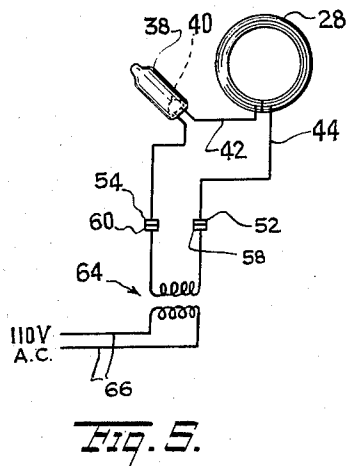
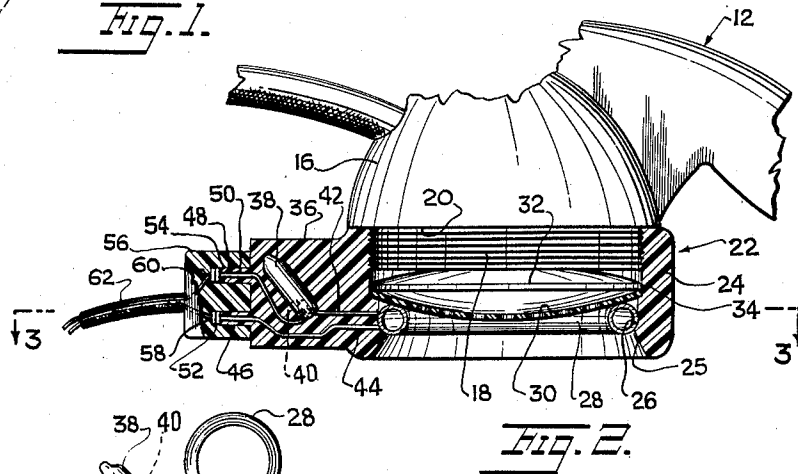
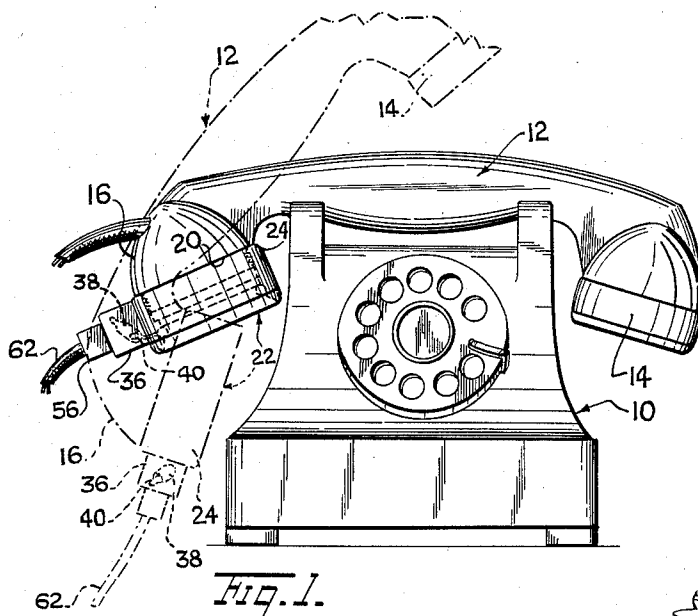
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2,911,488

GERMICIDAL DEVICE FOR PHONES

Filed May 23, 1957

2 Sheets-Sheet 1



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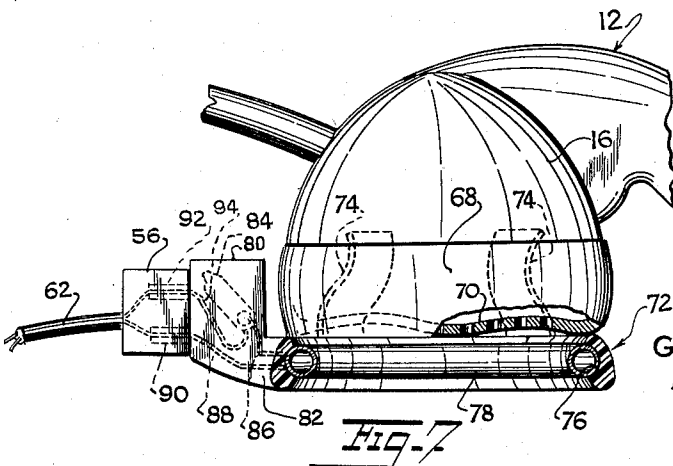
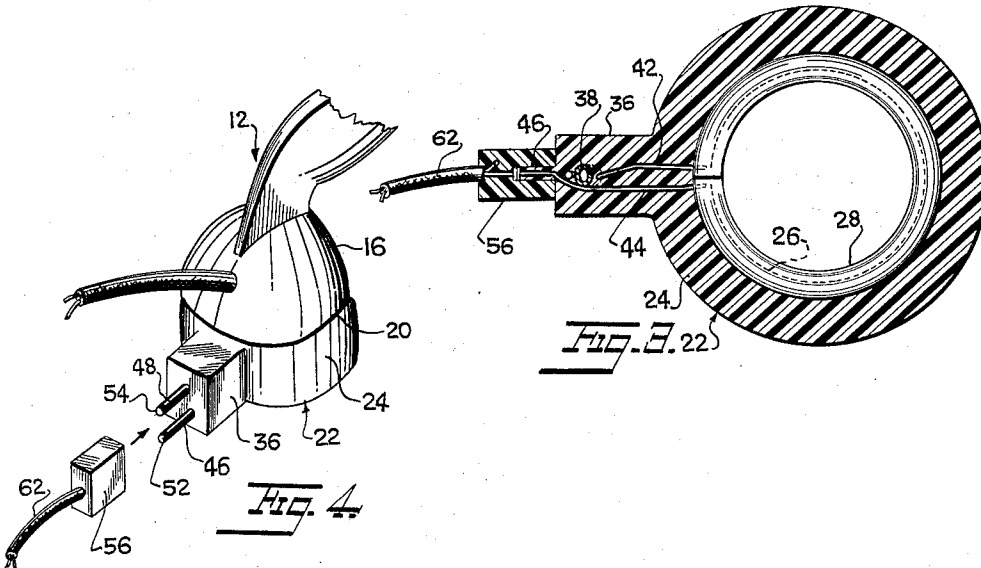
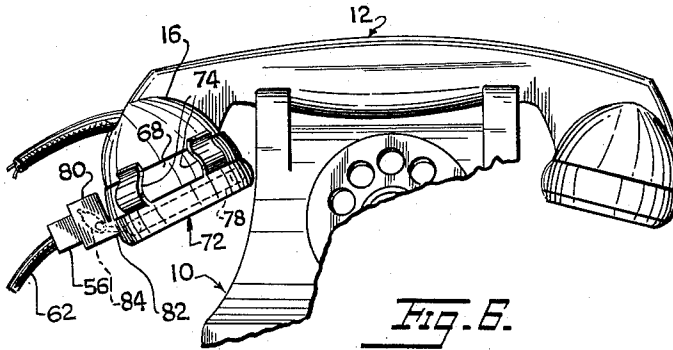
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2 Sheets-Sheet 2



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GERMICIDAL DEVICE FOR PHONES

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Application May 23, 1957, Serial No. 661,063

3 Claims. (Cl. 179—185)

This invention relates generally to telephone attachments and, more particularly, to a sterilizing attachment for a telephone, the attachment including an annular ultraviolet lamp extending about the mouthpiece of a telephone instrument, in position to direct germicidal rays against the mouthpiece.

In accordance with the invention, current to the lamp is controlled by a mercury switch which is carried, with the lamp, by the mouthpiece end of the transmitter-receiver of the instrument. The mercury switch is so arranged that whenever the transmitter-receiver is cradled, between calls, the switch is in position closing a circuit to the lamp, so that the lamp will be energized in these circumstances to disinfect the mouthpiece following each use thereof, before the next use. The mercury switch is so arranged that whenever the transmitter-receiver is picked up from its cradle, as for example during the making of a call, the switch is automatically disposed in open position, so that the lamp is deenergized when the telephone is actually in use, to prevent harmful radiation.

Heretofore, it has been proposed to provide sterilizing attachments for telephones, and some of these have included germicidal, ultraviolet lamps. However, in many instances these have involved complex, relatively expensive constructions, which in some cases have also had the undesirable characteristic of being excessively bulky, so as to prevent installation of the devices in relatively cramped quarters, such as in a pay booth, the construction further being undesirable because of the fact that the bulky devices have detracted from the appearance of the invention, rendering the same unsuitable for use in the home, where it would generally be conspicuously located.

In view of the above, one object of importance is to provide a compact, relatively inexpensive device of the character stated, which can be attached to or detached from a conventional telephone instrument with maximum ease and facility.

Another object is to so design the device that its germicidal action will be particularly effective, to insure proper disinfection of the mouthpiece of the instrument.

Another object is to provide a sterilizer as stated that can also be attached to the earpiece of the instrument, rather than to the mouthpiece, or perhaps to both of these components, as desired.

Yet another object is to provide a sterilizer as described that will be particularly designed to be placed in operation responsive to the natural movement whereby one places a telephone in its ordinary cradle, with the device being deenergized immediately, responsive to the natural movements of a user in picking up and using a telephone.

Another object is to provide a sterilizer as stated that will be formed in such a manner as not to detract from the normal and efficient use of the telephone instrument.

Still another object, in one form of the invention, is to form the sterilizer in a manner such as to permit it to be connected to a telephone, responsive merely to removal of the conventional mouthpiece provided upon

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the phone, and attachment of the sterilizer to the adjacent portion of the telephone, as a substitute for the mouthpiece.

In another form, it is an object to design the sterilizer in a manner such that it can be clipped onto a wholly conventional mouthpiece of a telephone instrument, without requiring any further action so far as operative disposition of the device in relation to the mouthpiece is concerned.

For further comprehension of the invention, and of the objects and advantages thereof, reference will be had to the following description and accompanying drawings, and to the appended claims in which the various novel features of the invention are more particularly set forth.

In the accompanying drawings forming a material part of this disclosure:

Fig. 1 is a front elevational view of a conventional telephone instrument, with the sterilizer attached to the mouthpiece thereof, the dotted lines showing the position of the parts when the transmitter-receiver is lifted from its cradle for use.

Fig. 2 is an enlarged sectional view diametrically through the sterilizing device, in which the adjacent portion of the telephone remains in elevation.

Fig. 3 is a sectional view, on the same scale as Fig. 2, taken substantially on line 3—3 of Fig. 2.

Fig. 4 is a fragmentary perspective view of the mouthpiece end of the transmitter-receiver, with the plug of the device detached.

Fig. 5 is a wiring diagram of the device.

Fig. 6 is a fragmentary elevational view of a telephone instrument equipped with a modified form of the sterilizer.

Fig. 7 is an enlarged view diametrically through the device of Fig. 6, with parts remaining in elevation, the mouthpiece of the telephone being shown partly in section.

In the form of the invention shown in Figs. 1–5, the sterilizer device is illustrated in association with a conventional telephone instrument generally designated 10. The instrument includes the usual base, having at its upper end a conventional cradle which receives the transmitter-receiver generally designated 12, the transmitter-receiver having at one end a receiver 14, and at its other end a transmitter 16.

As shown in Fig. 2, the transmitter 16 is conventionally formed with the reduced, threaded neck 18, the reduced diameter of the neck 18 defining a shoulder 20 at the base thereof.

Ordinarily, a mouthpiece, not shown in Figs. 1–5, is screwed onto the neck 18, and contains the usual voice pickup device.

In accordance with the present invention, the mouthpiece normally provided upon the telephone instrument is removed, and in its place there is attached to the neck 18 the sterilizer device 22 constituting the invention. The sterilizer device in this form of the invention, thus, includes a wide support ring 24 which may be formed of hard rubber, plastic, or other material well known in the manufacture of telephone instruments. Ring 24 on its inner periphery, has a sloping, circumferentially extending, inner surface 25 (Fig. 2) flaring in the direction of the outer ring and merging, inwardly from said outer end of the ring, into an internal lip 26 of the ring, on which lip is firmly, immovably supported an annular gaseous conduction tube 28. Tube 28 is preferably filled with any of various gaseous mixtures that will give off ultraviolet radiations of a value sufficient to provide a sterilizing effect upon adjacent surfaces to which the radiations are directed. Any of various mixtures can be used, that will produce this result, and the term "ultraviolet lamp," which will hereinafter be applied to the tube 28, will be understood as embracing any of various lamps that will produce the de-

sired results, it being well known that mixtures such as mercury vapor and argon, or neon and mercury vapor, will be capable of being satisfactorily employed for the intended purpose.

In any event, a concavo-convex, freely perforated mouthpiece 30, of disc-like shape, having its convex surface facing outwardly, is peripherally supported upon an internal shoulder 34 disposed inwardly from the ultraviolet lamp 28. Inwardly of the mouthpiece 30, there is provided the usual voice pickup means, which of course would be in engagement with spaced contacts provided within the transmitter 16.

Internal threads are formed in the ring 24, inwardly from the shoulder 34, to receive the neck 18. Therefore, by detaching the ordinary mouthpiece, and placing the voice pickup 32 thereof in a position in which said pickup will be supported upon or adjacent the disc 30, the device can be secured to the neck 18. It will then be in position to provide for normal use of the telephone while at the same time assuring that a suitable disinfectant action will be effected against the outer surface of the mouthpiece 30. Such action will also be effected against the surface 25 of the ring, said surface 25 being so sloped as to be disposed in the path of rays emanating from the lamp 28.

Integral or otherwise made rigid with the ring is a switch support block 36, and embedded in the block is a mercury lamp 38, which lies at an angle of approximately forty-five degrees to the plane of the lamp, that is, forty-five degrees to the general plane, also, of the mouthpiece.

As shown to particular advantage in Figs. 2 and 3, leads 42, 44 extend from opposite terminals of the lamp 28, said leads being embedded in the block 36. Lead 44 extends to an integral prong 46 projecting outwardly from the outer surface of the block 36 in spaced, parallel relation to a second prong 48. Lead 42 extends to one terminal of the mercury switch 38, in which switch there is provided a ball of mercury 40 adapted to bridge the terminals of the switch when the switch is positioned as in Fig. 2. Extending from the other terminal of the switch is a lead 50 extending within the prong 48. Leads 44, 50 terminate, at the outer ends of the prongs, in engagement with contacts 52, 54 of the respective prongs.

A female electric plug 56 has sockets shaped to receive the prongs in frictional engagement with the prongs. In the bases of the sockets, contacts 58, 60 are mounted, connected to the leads of a cord 62. Referring to Fig. 5, the leads of the cord 62 extend to one winding of a transformer 64, from the other winding of which extends the leads 66 of a cord extending to a conventional source of electrical power. The transformer can be mounted in a suitable housing, which may be secured to a suitable support in an inconspicuous location adjacent the telephone. It will be understood that a plurality of transformers can be used, and the particular arrangement and nature of the means whereby the current of the usual 110-volt house supply is adapted for energizing the ultraviolet lamp can be varied as desired.

It is mainly important, in other words, that the current supplied to the ultraviolet lamp be such as to be readily available, and, further, be such as to energize the lamp without danger of malfunctioning.

It will become apparent, by reference to the full line position of the parts in Fig. 1, and by reference also to Fig. 2, that when the transmitter-receiver is cradled, the mercury switch is tilted at such an angle as to dispose the ball of mercury 40 in bridging relation to the switch contacts. The lamp 28, therefore, is automatically energized each time the telephone is not in use, and the sterilizing action immediately begins to take place, so as to disinfect the mouthpiece 30 and the surface 25, before the next use of the telephone instrument.

It will further be apparent that the natural movement of cradling the transmitter-receiver will be sufficient to

cause the switch 38 to be operated to its closing position. In turn, the natural movement of picking up the telephone to use the same will cause the switch 38 to be tilted to a position such as to cause the ball of mercury 42 to be moved to the other end of the switch tube, opening the circuit to the lamp. The lamp, therefore, is immediately turned off each time the transmitter-receiver is picked up for use. The transmitter-receiver, in the dotted line showing of Fig. 1, is illustrated in the position assumed thereby immediately after it is removed from the cradle. When the transmitter-receiver is placed to the ear, in position for use, it will be seen that the switch will remain in its open position. This is true even though individual users may tilt the transmitter-receiver at different, selected angles according to their particular desires.

Therefore, when the telephone instrument is in use, the lamp is automatically deenergized, so as to prevent radiations harmful to the user. Each time the instrument is used, the sterilizing action will be halted to prevent such harmful radiations. Immediately, however, on hanging up of the telephone, the lamp is automatically energized once again, so as to disinfect the mouthpiece before its next use.

In Figs. 6 and 7, there is shown a slightly modified construction. This retains all the basic principles of operation of the first form. The modified construction, however, differs from the first form in that the ordinary mouthpiece of the instrument is left in place on the transmitter 16, with the sterilizing device being clamped detachably to the mouthpiece.

In this form of the invention, accordingly, there is illustrated a wholly conventional mouthpiece 68, which remains connected to the adjacent end portion of the housing of the transmitter 16. The mouthpiece 68 includes the perforated disc portion 70 which is integral with the side wall of the mouthpiece, these being conventional parts as will be readily understood.

In this form, the sterilizing device has been generally designated 72, and includes a support ring of plastic, hard rubber, or the like, integral or otherwise made rigid with spring clips 74 uniformly spaced about the circumference of the ring. The spring clips are so shaped as to be spreadable responsive to movement of the ring into engagement with the periphery of the mouthpiece. The rings, when spread, are placed under tension, and are snapped into place over the mouthpiece as readily seen from Figs. 6 and 7.

As will be observed, the ring 72 is provided with an internal, continuous groove providing a support lip or shoulder for the ultraviolet lamp. The groove has been designated 76, and supports the lamp 78 in position such that the lamp will direct its rays against the outer surface of the mouthpiece, and also against the sloped inner surface of the ring outwardly from the lamp.

The remaining components of the device are formed substantially similarly to the first form. Thus, there is provided a block 80, which in this case is connected to the ring by a connecting portion 82, which is integral both with the ring and the block. The block 80 contains a mercury switch 84 which is tilted at the same angle, relative to the lamp and mouthpiece, as the mercury switch tube of the first form.

The wiring is identical to that of the first form. Thus, leads 86, 88 extend from opposite terminals of a tube or lamp 78. Lead 88 extends within a prong 90, and adjacent the prong 90 is a prong 92. A lead 94 extends into the prong 92, from the other terminal of the switch. The plug 56 is identical to the first form.

In this form, the operational characteristics are identical to those of the first form. The main difference, as previously noted, resides in the fact that the modified construction of Figs. 6 and 7 is adapted to be clipped to the mouthpiece of a conventional transmitter-receiver

without removal of the mouthpiece normally provided upon the instrument.

It is believed that other modifications may well be resorted to, to fit particular situations. For example, the device could be embodied in a pay telephone. Such a telephone may have the transmitter-receiver normally suspended in a vertical position, from a hook-type cradle. In this instance, the mercury switch would be so tilted as to be in closed position when the transmitter-receiver is vertically disposed, with the switch being adapted to move to open position whenever the transmitter-receiver is tilted to extend from the ear to the mouth of a user, in the normal manner. This modification, it is thought, would be sufficiently obvious to those skilled in the art, after study of the construction of Figs. 1-7, as not to require special illustration herein.

While I have illustrated and described the preferred embodiments of my invention, it is to be understood that I do not limit myself to the precise constructions herein disclosed and that various changes and modifications may be made within the scope of the invention as defined in the appended claims.

Having thus described my invention, what I claim as new, and desire to secure by United States Letters Patent is:

1. An attachment for a telephone instrument of the type including a combination transmitter-receiver, comprising a support ring including means to connect the same to one end of said transmitter-receiver, a germicidal lamp carried by the ring, and switch means on the ring in circuit with the lamp adapted to be disposed in circuit-closing and opening positions responsive to location of the transmitter-receiver in cradled and use positions respectively, said ring being formed with internal threads, for engaging external threads provided upon said end of the transmitter-receiver, the ring including an internal shoulder outwardly from said threads of the ring, on which shoulder the lamp is supported, said ring including a second internal shoulder between the first shoulder and the threads of the ring, said attachment including a

mouthpiece supported upon the second shoulder and a voice pickup means supported inwardly from the mouthpiece in said end of the transmitter-receiver.

2. An attachment for a telephone instrument of the type including a combination transmitter-receiver, comprising a support ring including means to connect the same to one end of said transmitter-receiver, a germicidal lamp carried by the ring, and switch means on the ring in circuit with the lamp adapted to be disposed in circuit-closing and opening positions responsive to location of the transmitter-receiver in cradled and use positions respectively, said means for connecting the ring to said end of the transmitter-receiver comprising a plurality of clips engageable with the end of the transmitter-receiver, the switch means including a block rigid with the ring and spaced from adjacent ones of the clips, said switch means further including a mercury switch embedded in the block in circuit with the germicidal lamp.

3. An attachment for a telephone instrument of the type including a combination transmitter-receiver, comprising a support ring including means to connect the same to one end of said transmitter-receiver, a germicidal lamp carried by the ring, and switch means on the ring in circuit with the lamp adapted to be disposed in circuit-closing and opening positions responsive to location of the transmitter-receiver in cradled and use positions respectively, said means for connecting the ring to said end of the transmitter-receiver comprising a plurality of clips engageable with the end of the transmitter-receiver, said clips being of spring material and being angularly spaced about the circumference of the ring in position to be spread against the spring tension thereof by said end of the receiver so as to grip the end of the transmitter-receiver on engagement of the ring thereagainst.

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