

Dec. 7, 1948.

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2,455,816

TELEPHONE SUBSCRIBER'S SET ILLUMINATION

Filed Aug. 23, 1946

FIG. 1

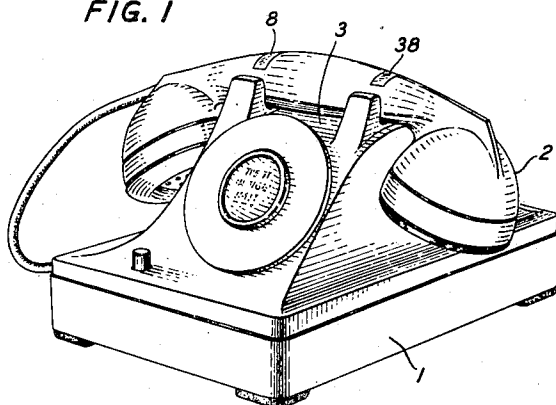


FIG. 2

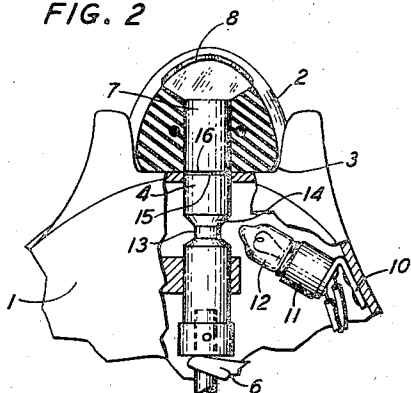


FIG. 3

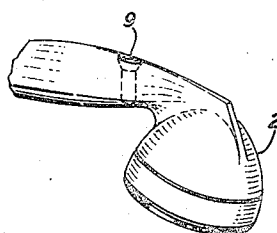
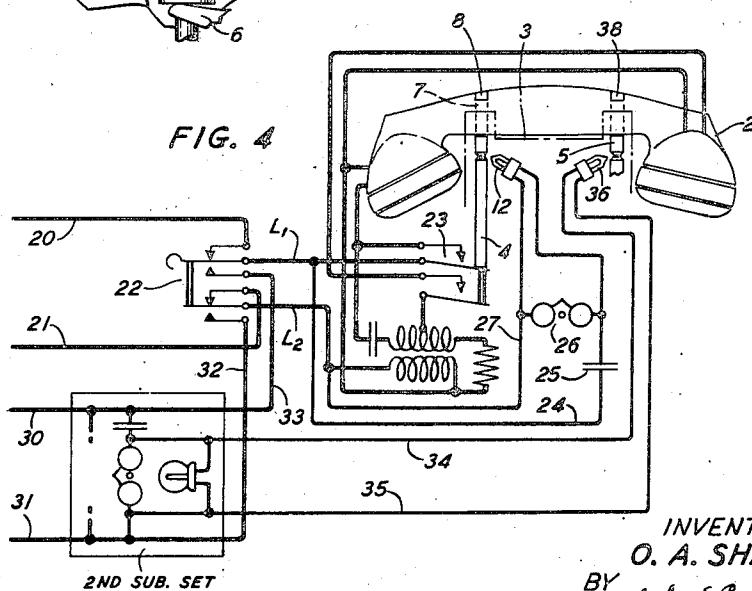


FIG. 4



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2,455,816

TELEPHONE SUBSCRIBER'S SET
ILLUMINATION

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Application August 23, 1946; Serial No. 692,463

5 Claims. (Cl. 179-100)

1

This invention relates to improvements in subscriber telephone sets and more particularly to an improved visual arrangement for indicating that a particular telephone set is being called.

As is well known in the art there are many telephone subscriber installations in which it is desirable for one reason or another to provide a visual indication that a particular phone is being signalled. For instance in large business offices there are some times large numbers of telephone sets which may be located on various closely spaced desks in which case the ringing of a particular phone may cause considerable confusion before it is identified. Further there are arrangements such as in hospitals where it is desirable that no bell be rung and wherein it is desirable to provide a visual signal only. There are also arrangements wherein two subscriber telephone sets may each have independent lines connected for instance to a private branch exchange, ordinarily located on the same premises, and wherein the two sets and the two lines may be arranged by means of a switch so that either may at times receive calls primarily intended for the other. It is sometimes desirable before responding to the call under such circumstances to know over which of the two lines the call is incoming.

Differentiation between calling signals is at times effected by means of bells or buzzers having different distinguishable tones. This is not satisfactory for all cases. For instance, the number of suitable distinguishable tones available may be less than the number of telephone sets to be distinguished where there are a large number of telephone sets. For these and for other reasons it is desirable at times to provide a visual signal to identify a called telephone set or to provide more than one visual signal to identify a particular one of a number of lines connected to a single set.

Arrangements are presently known in the art for providing a visual signal to indicate that a particular telephone set is being signalled. However, the visual signal arrangement of the present invention which in the present embodiment is incorporated in a well-known telephone set comprising a base and handset, affords a number of advantages over presently known arrangements.

Chief of these advantages is that it dispenses with the necessity for mounting the relatively fragile incandescent electric lamp and the lamp control equipment in the handset which latter as is well known is frequently dropped while it is being manipulated. As is generally understood

2

while the modern incandescent electric lamp gives long useful service when secured in a fixed position, it is relatively fragile when subjected to shock such as that caused by dropping a handset in which it is mounted.

Another advantage is that the elimination of the lamp together with its control relay and mounting apparatus from the handset eliminate the necessity for increasing the normal weight of the handset.

An object of the present invention is the improvement of subscribers' telephone sets:

A more particular object of the invention is the improvement of visual signal arrangements in subscribers' telephone sets.

The foregoing advantages and objectives are attained in the embodiment exemplifying the invention by means of a light conducting channel, comprising a plurality of light conducting elements arranged in series, between a controlled source of light within the base of a subscriber's telephone set and a prominent portion of the surface of a handset surmounting the base. The elements preferably have the light conducting properties of Lucite and will be termed hereinafter light conducting elements.

The invention may be understood from reference to the following description when read with reference to the associated drawings which describe and illustrate a preferred embodiment in which the present invention is incorporated. In the drawings:

Fig. 1 is a perspective view of a well-known type of subscriber's telephone set, comprising a base and handset, which shows a preferred location of two light conducting bezels on the periphery of the handset;

Fig. 2 is a side view partly in section showing the relationship of a lamp, a light conducting plunger and a light conducting rod terminating in a bezel on the surface of the handset;

Fig. 3 shows an alternative shape of light conducting bezel on the handset surface; and

Fig. 4 shows one type of circuit with which the invention may be employed.

Before proceeding with a detailed description of the invention, it is particularly pointed out that ordinarily a single visual signal will be incorporated in a telephone set. In certain installations more than one will be employed. In the following an arrangement wherein two visual signals are employed is described and such an arrangement is illustrated in the drawings. When a single visual signal is employed, as will

be obvious from the following, one may be eliminated.

Refer now to Figs. 1, 2 and 4 which show a hollow pedestal or base 1 in which various ringing and switching apparatus associated with the telephone set is mounted and a handset 2 all of a type well known in the art. The basic features of construction of the base and handset may be the same as those illustrated in Patent 2,351,459 granted to me on June 13, 1944, which is hereby incorporated herein by reference as though fully set forth herein. The present invention may be considered and improvement over the invention disclosed in Patent 2,351,459.

The upper portion of the hollow base 1 which houses the cooperating apparatus is formed into a cradle 3 in which the handset 2 is supported when in the normal idle condition. When the handset is in the normal idle condition, the weight of the handset depresses two light conducting plungers 4 and 5, indicated in Fig. 4 at the right-hand and left-hand portions of the cradle as indicated. Plungers 4 and 5 are normally urged upwardly through engagement of their lower surfaces with the left-hand end of a lever element 6 which controls the switching contacts. The element 6 is in turn urged upwardly by a spring. A description of the details of these elements are not necessary to an understanding of the present invention. They are disclosed in Patent 2,351,459 mentioned in the foregoing.

In vertical alignment with each of light conducting plungers 4 and 5 are light conducting rods such as 7 which terminate in individual polished light conducting bezels 8 and 38 on the upper surface of the handset. The bezels such as 8 are each preferably formed with the rod 7 out of a single piece of light conducting material, but may, if desired, be separate from the rod. The upper surface of the bezel such as 8 conforms to the periphery of the handset 2. The bezel may be of any desired shape, but preferably extends laterally across the top and projects downwardly on both the front and rear of the hand grip portion of the handset as illustrated in Figs. 1 and 2, so, that when the bezel is illuminated it may readily be observed from a considerable distance. As illustrated in Figs. 1 and 2 the outline of the surface of the bezel on the handset is approximately rectangular and in Fig. 3, alternatively, it is circular.

Two V-shaped brackets 10 are secured to the upper portion of the inner rear wall of the base in any convenient manner. Mounted individually on each of the two brackets 10 is a lamp base 11 secured in which is a lamp 12. The lamp is preferably shielded or coated in any convenient manner so that light is emitted from only a small area at its end portion. A portion such as 13 of the light conducting plungers 4 and 5 intermediate their ends is reduced in section and an area such as 14 of the upper surface of the reduced section in juxtaposition with the left-hand end of the lamp individual thereto, when the plunger is depressed, is polished as are the upper horizontal surfaces of the plungers 4 and 5 and the lower surfaces of the rods such as 7. The bracket such as 10, lamp base 11, lamp 12 and reduced section 13 are so positioned that the small area of the lamp from which the light is emitted when the lamp is illuminated is juxtaposed the polished area of the reduced section 14 of the corresponding light conducting plunger. The surface of each plunger is preferably shielded or coated in any convenient manner so that

it is impervious to light except through the small polished area 14. Thus when a particular lamp is lighted a single bezel is illuminated.

The lamp such as 12 is illuminated in any convenient manner in response to the application of the calling signal condition. For such condition the plungers are in the normal depressed position. The light passes through the small unshielded area of the lamp through the unshielded polished area 14 of the plunger, through the plunger such as 4, through the contiguous polished surfaces such as 15 and 16 of the plunger 4 and the rod 7 and illuminates the surface 8 of the bezel. When the bezel 8 is shaped and positioned as indicated and the illuminating circuit and the light conducting path are of proper power and area the lighted surface of the bezel may be observed from a considerable distance. For certain installations, however, where the telephone set is located for instance at a particular desk and is to be answered only by a party seated at the desk and where it is preferable that the calling signal be inconspicuous, a very small bezel may be employed.

While ordinarily the visual signal of the present invention will be employed in conjunction with the usual audible signal such as a ringer or buzzer it is to be understood that it may be employed without the audible signal. The visual arrangement of the invention herein provides a convenient means of limiting the range of visibility and thus, when the visual signal is used alone, of the range of comprehension of the calling signal. It is contemplated that in certain secret installations such as in a military outpost the size of the illuminable bezel may be very small and the range of comprehension of the signal no more than a few feet.

It is contemplated that for most installations only a single light conducting bezel and associated rod, plunger and lamp will be provided for each telephone set. For the normal arrangement therefore only one plunger will be required to be of light conducting material and the other may be constructed of the usual material employed therefor.

It is particularly pointed out that when the present invention is employed with an audible signal a number of combinations of the two are possible which are readily available to those skilled in the art. For instance, it is contemplated that the associated subscriber telephone circuit may be arranged so that in response to a single short ring the bezel is illuminated, and remains illuminated as long as the calling party remains on the line, and is then extinguished.

The details of suitable subscriber telephone set circuits for energizing a single lamp and illuminating a single bezel are shown in Patent Number 2,298,207 granted to E. W. Gent, October 6, 1942, Figs. 6 and 7 and Patent 2,298,207 is incorporated herein by reference as though fully set forth herein. It is particularly pointed out that when the subscriber's telephone set circuits of Patent 2,298,207, Figs. 6 and 7 are employed with the arrangement of the present invention the lamp 28 and the ringer 17 shown in each of Figs. 6 and 7 of Patent 2,298,207 are not located in the handset but are located in the hollow supporting base 1 with the lamp juxtaposed the area 14 as shown in Fig. 2 herein.

In the arrangement per Fig. 4 herein, a circuit is shown which is suitable for use in cases where a first subscriber's line circuit is connected to a first subscriber telephone set and a second

subscriber line circuit is connected to a second subscriber telephone set and is multipled to the first subscriber telephone set and discrimination between the two lines is provided by illumination of a particular one of two bezels in the first telephone handset.

The two subscriber telephone set circuits may for instance be in accordance with Patent 2,298,207, Fig. 6 but having the lamp 12 in Fig. 4, which corresponds to lamp 28 in Patent 2,298,207, Fig. 6 located in the base of the set juxtaposed the area 14 of the light conducting plunger. Conductors 21 and 22 may extend from a first subscriber line circuit at a private branch exchange, or P. B. X as it is known in the art (not shown) through the normally closed contacts of a double-pole two-position switch into the base of the first subscriber telephone set where the talking circuit is normally open at the contacts of switch 23, and the audible and visual signal circuit is closed from conductor L₁, through conductor 24, condenser 25, ringer 26 in parallel with the filament of lamp 12, and conductor 27 to conductor L₂. When an alternating potential is applied to conductors 20 and 21 the ringer 26 and the lamp 12 are simultaneously energized. The light of the lamp is conducted through the light channel from the interior of the base to illuminate the bezel on the upper surface of the handset while the ringing signal persists. When the switch 23 is actuated the calling signal circuit is shunted by the talking path.

Conductors 30 and 31 are two conductors incoming from a second subscriber line circuit. These conductors first terminate in the second subscriber set which is identical with that shown in detail in Fig. 4 herein and in Fig. 6 of Patent 2,298,207 except that the incoming conductors 30 and 31 which connect to the calling signal equipment in the second subscriber set and to the talking circuit through the switch in the second set are multipled through conductors 32 and 33 to the open make contacts of switch 22 and a second lamp circuit is connected by means of conductors 34 and 35 to a second lamp 36 juxtaposed the polished area of the second light conducting plunger 5 of the first subscriber set.

In response to an alternating potential impressed on conductors 30 and 31 the ringer and lamp in the second subscriber set will be energized and simultaneously the lamp in the first set and the bezel associated therewith will be illuminated. If the second subscriber set is not answered switch 22 is operated and the call is taken on the first subscriber set.

What is claimed is:

1. In a subscriber telephone set, in combination, a base portion, a hand telephone set mounted on said base portion, a source of light within said base portion and a light conducting channel, said channel comprising a plurality of juxtaposed light conducting elements, extending from said light source to the exterior of said base portion, then

through said handset to a prominent portion of its surface.

2. In a subscriber telephone set, in combination, a base portion, a hand telephone set mounted on said base portion, a source of light within said base portion, a light conducting element within said base portion, extending to the exterior of said base portion, a light conducting element in said telephone set, said elements having a portion of the surface of one juxtaposed a portion of the surface of the other, so that light may be conducted from the interior of said base to a prominent portion of the surface of said handset.

3. In a subscriber telephone set, in combination, a base portion, a hand telephone set mounted on said base portion, a source of light within said base portion, a first light conducting element within said base portion, a second light conducting element in said handset, said elements disposed so as to conduct light from said source to a prominent portion of the surface of said handset.

4. In a subscriber telephone set, in combination, a base, a hand telephone set mounted on said base, a source of light within said base, a light conducting plunger juxtaposed said source, a light conducting element in said hand telephone set juxtaposed said plunger, said element communicating with the exterior surface of said hand telephone set, said source, plunger and element constituting a light channel extending from said source within said base through said plunger, through said element, to the exterior surface of said hand telephone set.

5. In a subscriber telephone set, in combination, a hollow base portion for accommodating telephone switching and signalling apparatus, a hand telephone set comprising a unitary transmitter and receiver interconnected by a hand grip portion mounted on said base, said base impervious to light, a source of light within said base, a light conducting plunger extending from within said base to the exterior of said base, said plunger actuable by said set, a light conducting element in said set juxtaposed said plunger, said source, plunger and element constituting a light channel to conduct light from said source within said base to the upper exterior surface of said set and means for energizing said light source and illuminating said surface in response to a telephone calling signal.

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REFERENCES CITED

The following references are of record in the file of this patent:

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Number	Name	Date
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2,222,476	Caroselli	Nov. 19, 1940
2,298,207	Gent et al.	Oct. 6, 1942
2,316,540	Danley et al.	Apr. 13, 1943
2,325,185	Kate	July 27, 1943
2,351,459	Shann	June 13, 1944