Jan. 11, 1944. S. T. CURRAN 2,338,757

TELEPHONE SET

Filed June 12, 1941 2 Sheets-Sheet 1

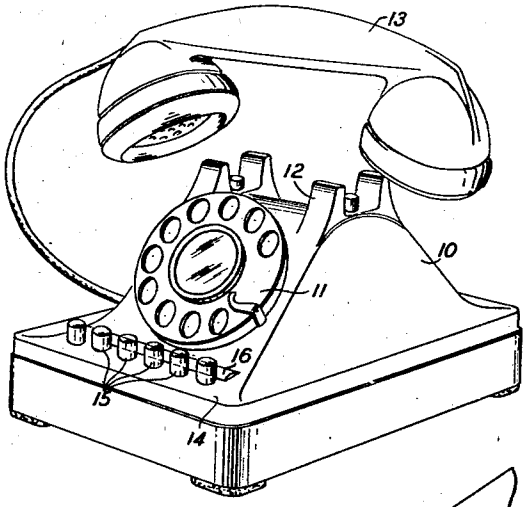

FIG. 1

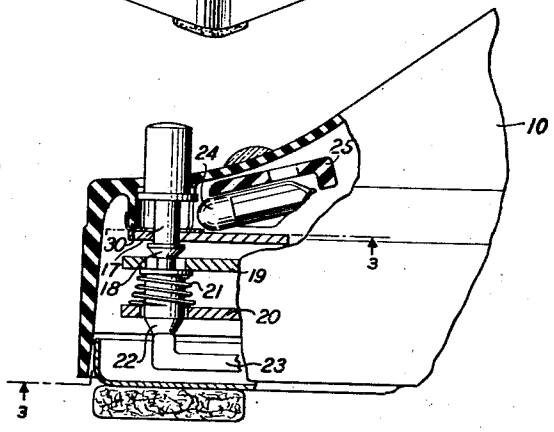

FIG. 2

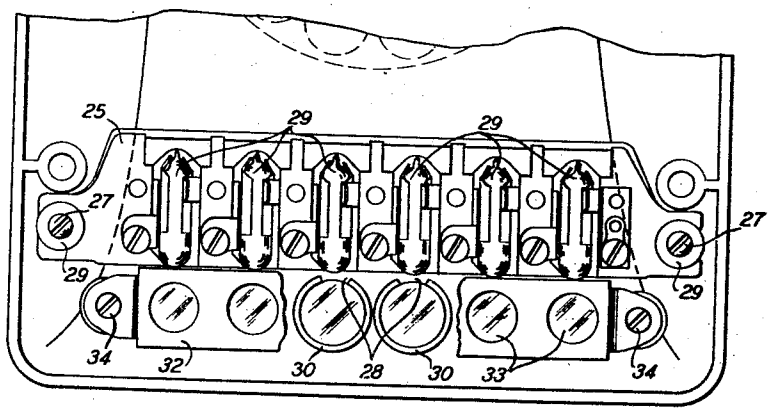

FIG. 3

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FIG. 4

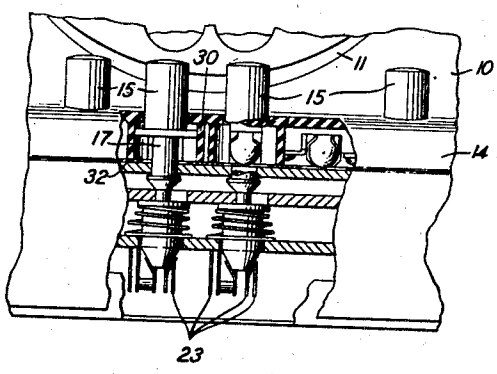


FIG. 5

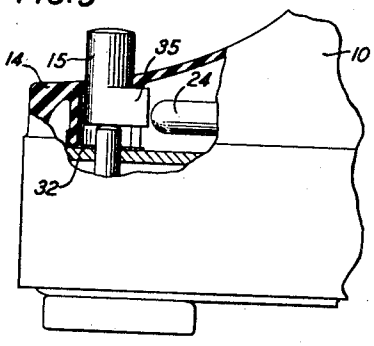


FIG. 6

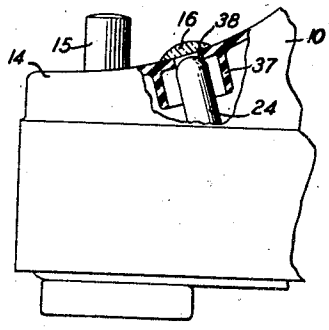
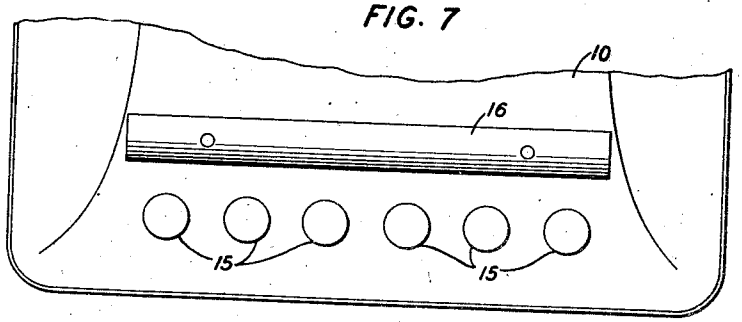


FIG. 7



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UNITED STATES PATENT OFFICE

2,338,757

TELEPHONE SET

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Application June 12, 1941, Serial No. 397,691

7 Claims. (Cl. 179—99)

This invention relates in general to telephone sets adapted to be associated with a plurality of lines and having signaling means incorporated therein to indicate the operating condition of the different lines.

In certain types of telephone sets as, for example, those called upon to handle one or more trunk or PBX lines, it has been the practice to employ lamp indicators separated from the telephone set to indicate on which line a call is coming in or which lines may be busy at the time an outgoing call is originated. These indicators preferably are mounted in locations in close proximity to the set with which it is associated. Such an arrangement is not entirely satisfactory from installation, appearance, and first cost standpoints. It is therefore an object of the present invention to provide a telephone set equipped with switching keys and having incorporated therein signal means for indicating the operative condition of the various lines and to obtain the advantages of such an arrangement without appreciably increasing the size or altering the appearance of the set. To attain this object and in accordance with the features of the invention signaling lamps are incorporated within the housing of a telephone set and arranged to indicate the line conditions by directly illuminating the associated key buttons or illuminating adjacent positions of the set designation strip. The invention may be more clearly understood by reference to the accompanying drawings in which:

Fig. 1 is a perspective view of a telephone set embodying features of the invention;

Fig. 2 is a partial sectional view through one of the switching keys;

Fig. 3 is a bottom view taken along the line 3—3 of Fig. 2 looking in the direction of the arrows;

Fig. 4 is a partial view in cross section showing the switching keys;

Fig. 5 is a view showing a modified type of key button and a signaling lamp associated therewith;

Fig. 6 is a similar view of a modification in which the signaling lamp illuminates a designation strip; and

Fig. 7 is a partial plan view showing more clearly how the designation strip is associated with the key buttons.

As shown in Fig. 1 the telephone set is provided with a standard type of housing 10, a calling dial 11 and cradle 12 to receive a standard type of handset 13. The shelf portion 14 of the set is equipped with key buttons 15, 15 and in close proximity thereto is a designation strip 16 for designating the lines associated with the respective key buttons. The switching keys as shown more clearly in Figs. 2 to 4 are of standard design comprising a shank portion 17, locking cam 18 cooperating with a locking plate 19, mounting plate 20, compression spring 21 and operating cam 22 which operates contact spring 23, 23. The signaling lamps 24, 24 are mounted with their associated contact springs upon a mounting plate 25 of suitable insulating material which is secured to the set housing by means of screws 27, 27, passing through soft rubber bushings 29, 29 which cushion the lamps against jars and thus prevent filament breakage. In order not to appreciably increase the depth of the desk portion of the set, these lamps are mounted substantially horizontally and are in alignment and in close proximity to slots 28, 28 in the insulating guide members 30, 30, moulded integral with the housing. A retaining member 32 provided with openings 33, 33 through which the switching key plungers or shanks 17 extend is mounted on the housing by means of screws 34, 34 and serves to retain the key buttons in position. The key buttons 15 are made from a light transmitting material, preferably a material such as a methylmethacrylate resin which has a high index of refraction. Upon the passage of current through the filament of the lamps 24, the light rays pass through the slots 28 in guides 30 to illuminate the buttons and thereby give an indication as to the particular line conditions. The lamps 24 are mounted in close proximity to the respective slots 28 which are of a width such that the buttons on adjacent keys are not illuminated to give false signals. These buttons instead of being transparent may be of translucent material which is capable of satisfactory illumination under the conditions prevailing.

In the arrangement disclosed in Fig. 5, the key buttons 15 are provided with right-angled extensions 35 which are positioned in close proximity to the lamps 24 so that light rays emanating from the lamp filaments pass into the extensions 35 and illuminate the key buttons 15. In this modification, it is highly desirable that the key button and the extension member be of a material having high clarity and a high index of refraction in order to insure good transmission of the light rays to the upper portion of the button. Among materials suitable for this purpose are acrylic resins, styrene resins and quartz. In the arrangement disclosed in Figs. 6 and 7, the ends of the lamps 24 extend into the masking rings 37 and suitable openings 38 in the shelf

portion of the set are provided so that when a lamp lights up an illuminated spot appears on the designation strip 16 which is composed of a light dispersive material or a transparent material with a light dispersive surface. In this arrangement, the lamps may be mounted substantially perpendicular to the designation strip since they can extend down into the portion of the set and do not interfere with the operation of the switching keys.

What is claimed is:

1. A telephone set comprising a plurality of switching keys mounted within the housing of said set and having operating buttons composed of a light transmitting material extending outside of said housing and signal lamps respectively individual to certain of said keys, said lamps being so mounted as to cause the emission of light from the corresponding key buttons when operating current is passed through said lamps.

2. A telephone set comprising a plurality of switching keys mounted within the housing of said set, operating buttons for said keys extending outside of said housing and composed of a material having a high index of refraction and signal lamps respectively individual to certain of said keys for causing the emission of light from the corresponding key buttons when operating current is passed through said lamps.

3. A telephone set comprising a plurality of switching keys mounted within the housing of said set, operating buttons for said keys extending outside of said housing and composed of an acrylic resin having a high index of refraction and signal lamps respectively individual to certain of said keys for causing the emission of light from the corresponding key buttons when operating current is passed through said lamps.

4. A telephone set comprising a plurality of switching keys mounted within the housing of said set, operating buttons for said keys extending outside of said housing and composed of a light transmitting material, signal lamps respectively individual to certain of said keys and guide rings individual to said buttons and having slots therein to permit the passage of light rays from a signal lamp to its associated key button, said guide members being adapted to intercept light rays from the other of said lamps.

5. A telephone set comprising a plurality of switching keys mounted within the housing of the set, operating buttons for said keys extending outside of said housing and composed of a light transmitting material, signal lamps respectively individual to certain of said keys and mounted substantially perpendicular to said key buttons and guide rings individual to said buttons and having slots therein, the inner ends of said buttons being provided with a right-angled extension portion extending through said slot and in close proximity to the ends of said horizontally mounted signal lamps whereby the key buttons are illuminated upon passage of current through said lamps.

6. A telephone set comprising a plurality of switching keys mounted within the housing of said set, operating buttons for said keys extending outside of said housing and composed of a light transmitting material, signal lamps respectively individual to certain of said keys, and guide rings moulded integral with said housing and individual to said buttons, said guide rings having narrow slots therein in alignment with the corresponding signal lamps for permitting the passage of light rays therethrough.

7. A telephone set comprising a housing within which a plurality of switching keys are mounted, said keys being provided with key buttons composed of a light transmitting material and extending outside of said housing, a mounting plate secured within said housing and provided with means for mounting a plurality of signal lamps substantially horizontal and in alignment respectively with said key buttons and means for directing light rays from one of said lamps to its corresponding key button and intercepting light rays from the other of said lamps to said button.

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