Oct. 7, 1952 J. A. PETNEL 2,613,280

TELEPHONE DIAL

Filed Aug. 16, 1950

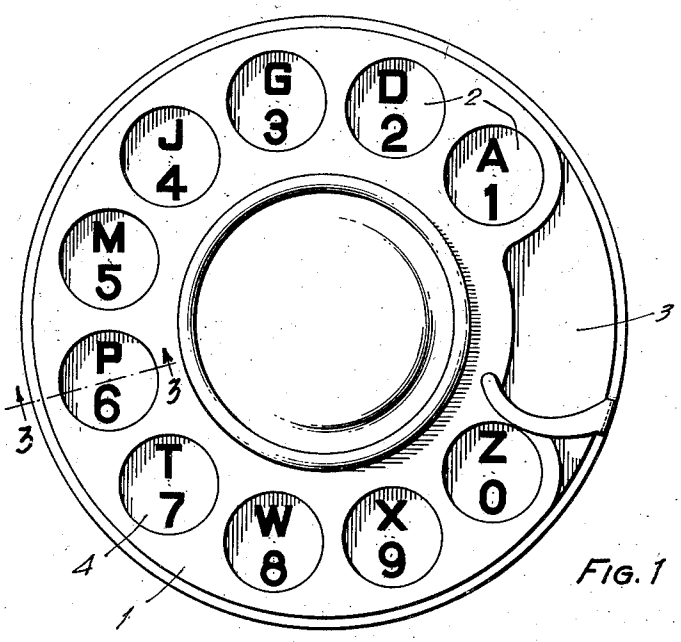


FIG. 1

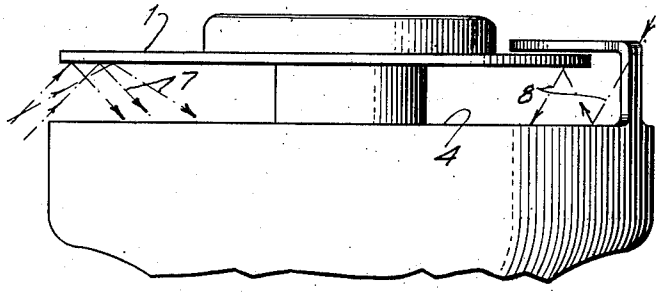


FIG. 2

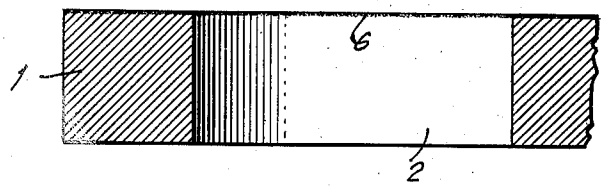


FIG. 3

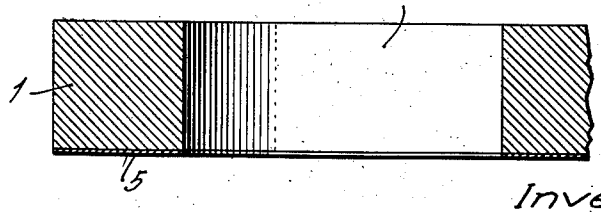


FIG. 4

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TELEPHONE DIAL

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2 Claims. (Cl. 179—90)

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My invention relates to telephone dials and particularly to improvements therein which substantially increase the visibility of the numbers beneath the dial.

The principal object of my invention is to provide a telephone dial having an under or bottom surface of high light reflectivity, and an upper or top surface having light reflecting properties which are substantially less than those of the under surface. A further object is to provide a telephone dial in which the upper or visible surface thereof, which is contacted by the fingers, is rendered light absorbing to a substantial degree without the use of paint, enamel or other superficial coatings which are vulnerable to wear.

I accomplish these objects by the novel dial described below and illustrated in the accompanying drawings in which—

Fig. 1 is a plan view of the dial showing a numbered and lettered surface beneath the dial;

Fig. 2 is a fragmentary, side elevation view of a telephone apparatus with my dial thereon;

Fig. 3 is a greatly enlarged, fragmentary section through my dial in the plane 3—3 of Fig. 1; and

Fig. 4 is a section similar to Fig. 3 but showing a modification thereof.

Referring to the drawings—

1 is the dial which is formed of comparatively thin metal having the usual finger openings 2 therein and a marginal cut out portion 3 between the numerals 1 and 0 to provide a space for the insertion of a cloth or other means for wiping off the surface bearing the numerals and the letters. The base 4, which bears the numerals, is white and the numerals are some times printed in red with the letters in black, or vice versa; or both the letters and the numerals may be printed in the same color. Thus, they are visible through the openings in the dial if the illumination is sufficient.

The dials in most instances are painted or enameled black on both sides so that no light is reflected from the under side of the dial to the base bearing the numerals and letters. In some instances, however, both the upper and lower surfaces of the dial are bright or highly polished but this is objectionable and impairs the visibility of the numerals and letters by reason of the fact that light from the top surface of the dial is reflected to the eye.

I find that the visibility of the numerals and letters may be greatly increased by making the under surface of the dial of a light reflecting character and the upper surface of the dial of a light absorbing character, or at least of such

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character that the light reflected therefrom is substantially less than the light reflected from the under side thereof.

This may be accomplished as shown in Fig. 4 by forming the dial 1 of a metal of a comparatively dark character such as brass or bronze and applying a layer of polished chromium plate 5 to the underneath side thereof. Such a dial is, of course, formed entirely of metal and the darker color of the upper side thereof is not produced by paint or lacquer which wears off rather quickly, depending on how often the dial is used.

In Fig. 3, I have shown a preferred type of dial which is formed of stainless steel, preferably a chromium-nickel steel of the 18–8 type, and has in and integral with the top surface thereof a thin film 6 of dark colored oxide which may be substantially black. Since such a film is actually in the surface of the steel rather than on the surface thereof, it cannot be removed by friction without also removing a portion of the metal surface. Therefore, the dark color thus applied to the upper surface of the dial is very stable and substantially permanent.

Such a film of oxide may be applied to stainless steel from which the dial is formed, or to be formed, by merely immersing it in a solution, preferably hot, of sulfuric acid, water and some substance which will prevent the sulfuric acid from etching the steel. The proportion of sulfuric acid to water in the solution is not particularly critical and may constitute from 25 to 55%, by weight, of the solution. To prevent the acid from eating into the steel a number of substances such, for example, as ammonium dichromate or any of the other dichromates may be added to the acid-water solution. Since stainless steels vary a great deal in their composition and it is desirable to use only sufficient dichromate to prevent etching, the quantity is best determined by immersing a small specimen of the steel in the acid-water solution which has been heated to the desired temperature, and then adding the dichromate until the solution ceases to attack the steel.

The color film of oxide is formed in the steel by merely immersing it in the above solution, and the time required depends on the temperature of the solution. The treatment does not affect the surface characteristics of the steel except as to color. In other words, if the surface is polished it remains polished but turns black, or substantially black.

Since both sides of the steel are colored by the

treatment, it is necessary to grind off the color from the under side and buff the surface to a high polish to provide the desirable reflectivity. But, because the under side of the dial must be highly polished, the removal of the color from the under side and the polishing thereof does not add appreciably to the cost.

Light rays 7 which directly strike the under side of the dial are reflected downwardly on to the lettered and numbered surface; and some of the light rays 8 which strike said surface directly, between or at the sides of the numerals or letters thereon, are first reflected upwardly to the under side of the dial and then reflected back to said surface.

What I claim is:

1. A telephone dial formed entirely of stainless steel; the bottom surface of said dial being polished to provide a high light-reflectivity; and the top surface thereof having in and integral therewith a dark colored film of oxide.

2. A telephone dial formed entirely of a stainless steel alloy containing both chromium and nickel as alloying elements; the upper surface of said disk having in and integral therewith a dark colored, light-absorbing film containing oxides of said alloying elements; and the under surface of said dial having the normal color of said steel and being highly polished to provide high light-reflectivity therefrom.

JOSEPH A. PETNEL.

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