April 1, 1947. R. P. TALBOT 2,418,436

IDENTIFYING MINUTE MEASUREMENT

Filed July 5, 1943

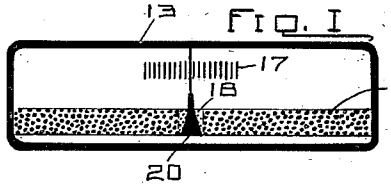

FIG. 1

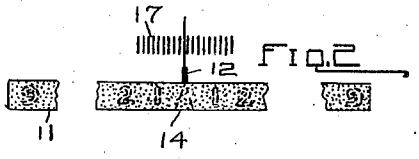

FIG. 2

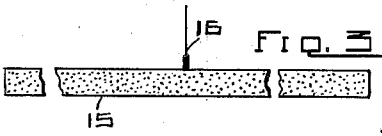

FIG. 3

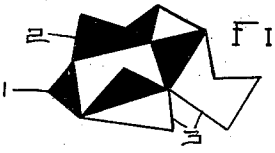

FIG. 4

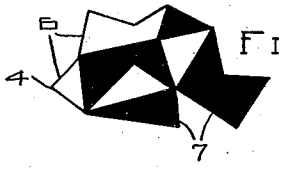

FIG. 5

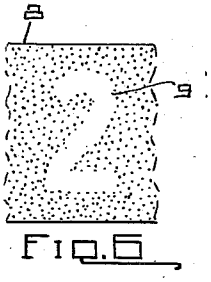

FIG. 6

FIG. 7

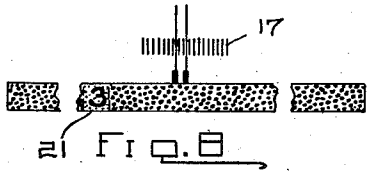

FIG. 8

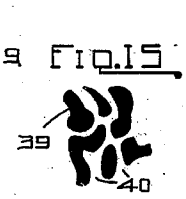

FIG. 15

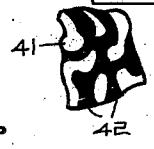

FIG. 16

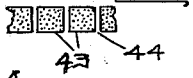

FIG. 17

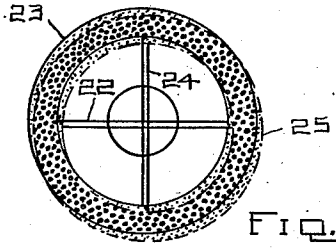

FIG. 9

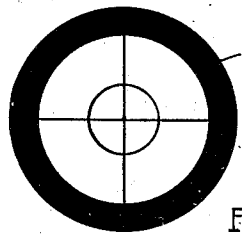

FIG. 10

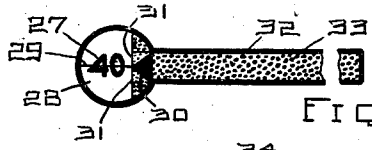

FIG. 11

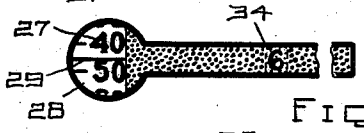

FIG. 12

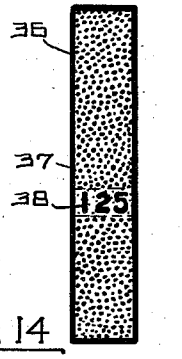

FIG. 14

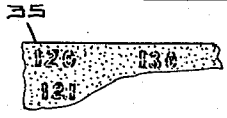

FIG. 13

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IDENTIFYING MINUTE MEASUREMENT

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Application July 5, 1943, Serial No. 493,509

4 Claims. (Cl. 116—114)

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This invention relates to disclosing readily readable indications of measurements.

This invention has utility in providing definite indication when accurate register is had between a pair of elements, one superposed over the other, in proximity. Each element provides a general uniform appearance view area comprising opaque and contrasting or clear portions. With the clear portions of one of the elements transparent, a notation disclosing complementary area upon the other is adapted, upon relative movement into register relation for the opaque on one to register with the clear portions of the other to establish an opaque disclosure of the notation.

Referring to the drawings:

Fig. 1 is a front view of the dial of an ammeter showing the register position therefor;

Fig. 2 is a detail view of the fixed or stationary element normally unobservable notations therealong;

Fig. 3 is a detail view, also with portions broken away, of the adjacent relatively shiftable element, in entirety as to its area that of the general area of the element of Fig. 2. except that in Fig. 3 the composite character of the area is thruout, while in Fig. 2 the areas local to the notations are complementary;

Fig. 4 is an enlarged fragmentary detail of the asymmetrical background area of Fig. 3;

Fig. 5 is similar to Fig. 4, but is complementary or reverse therefrom, in that Fig. 4 may be construed as a positive and Fig. 5 a negative. These complementary or negative regions or areas are the notations in Fig. 2 in the bounds of the primary background or positive of Fig. 4;

Fig. 6 is a fragmentary view of primary background or positive of Fig. 3, cleared for a character;

Fig. 7 is a detail view of the negative or converse portion from the location cleared of positive in Fig. 6, and which is to be assembled therewith into the element of Fig. 2;

Fig. 8 discloses a 3 character notation of off-register position for the scale or indicator window of Fig. 1;

Fig. 9 is a view of an aiming or survey instrument eye-piece area having positive and negative ring areas of complete inter-responsive character thruout (and not local to a notation, such as Figs. 6, 7), with threads, cross hairs or lines of usual engineering practice, when slightly out of register, but pronounced in such showing;

Fig. 10 is another view of the device of Fig. 9, at accurate register indication therefor, comparable with the showing of the notation "3" Fig. 8;

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Fig. 11 is an embodiment hereunder wherein the major notations are readily discerned as shifted past a window, say in a drum type of weight measuring scale, with accentuation feature at the unit position therefor;

Fig. 12 shows a departure from unit register position for the equipment of Fig. 11, wherein the extent of such intermediate point is clearly brought out by the additional notation;

Fig. 13 is an embodiment of notations distributed in different series over a more extended area;

Fig. 14 shows the window, say as a vertical dial, adapted to disclose notation register in a complete direct reading, which may be in minute units of length;

Fig. 15 is an enlarged fragmentary detail of a composite character background of asymmetrical area produced by reticulation on a film base;

Fig. 16 is a view on converse or negative from the showing of reticulation in Fig. 15; and

Fig. 17 shows the blocking off for the notations of the respective identifying regions therefor to be assembled in Fig. 2.

More acceptable results for readily rendering the operations hereunder distinctive have followed from having a background 1 (Fig. 4) with black portions 2 and approximately equal extent of white portions of areas 3. There is accordingly an area of symmetrical assembly of asymmetrical elements adapted separately to combine into a seemingly regular background. The black and white area or pattern (Fig. 4) when having a unit length dimension thereon one hundredth, or even one fiftieth as for instance 1'' to .01'' or .02'', that as appearing distinct, changes the effect upon the naked eye for the two patterns of black and white to merge into a gray. The effect of the reduction is to impart the gray smooth appearance.

Reverse 4 (Fig. 5) has white portions 6 and black portions 7, as complementary or counterparts from the portions 2, 3 (Fig. 4). The relationship is of positive 1 (Fig. 4) and negative 4 (Fig. 5).

An area 8 (Fig. 6) of the background 1, when the individual white and black portions are reduced in areal extent, will have a smooth gray appearance, and may have a notation disclosing region 9 cleared therefrom. When reduced to identical dimension in negative 4 for identical register in counterpart with the area 8, at the

cleared region 9 location thereon, negative notation 10 is taken (Fig. 7). By this step there is produced an indicator element or strip 11 (Fig. 2). In this instance the strip 11 is taken as a fixed dial-sort of element having a medial marker or index line 12 extending therefrom. A framing window 13 is provided (Fig. 1). Complemental patterns are along the strip 11 at different spacings for the respective character notations, with a medial spread pattern complemental portion 14 (Fig. 2) from the line 12. When out of complemental relation, the pattern regions are not normally distinguishable. As a registry is effected, the visibility is pronounced.

At the window 13, closely adjacent the strip 11, is a strip 15 (Fig. 3) having an index 16. Fixed with the index 12 are scale markings 17 (Fig. 2). This strip 15, as well as the general area of the strip 11 as away from the notations and marker portion, is smooth or regular gray of the positive 1 at the reduced dimension thereof.

In practice, it is desirable in the cooperation as screen for one of the strips as to the other, that the strip as toward the observation side be a transparency at the clear or light regions. With a rear or back lighting as in electrical instruments, and each strip transparent at the non-opaque regions, the register and off-register amplifications are handled more expeditiously.

When there is register of like with like, as positive with positive a gray region 18 (Fig. 1) comparable with the single ply showings of Figs. 2, 3, 6, 7, is had. When there is departure from exact register, there is disclosed the somewhat darker gray region 19 (Fig. 1). At the register of a complementary region with its counterpart, the blacks of one are on the whites or light portions of the other and there is resultant opaque 20 (Fig. 1) for exact, and 21 (Fig. 8) for the notation disclosure of departure from registry, less distinctly shown by the markings 17, providing a supplemental check therefor.

For the purposes of aiming or locating a point, cross-hairs 22 (Fig. 9) from positive background ring 23, may be set as to a relatively shiftable pair of similarly positioned cross hairs 24 of identical diameter counterpart or complementary ring 25. In the set-up local areas herein disclosed for irregular or relatively asymmetrical geometrical shapes, photographically reduced, the pair of transparencies 11, 15, (Figs. 2 and 3), when assembled, may be in nearly if not actual contacting relation and the subject-matter hereof on such adjacent sides. The markings 17 may be dispensed with, while the fineness of the grain-appearing structure is responsive even for almost invisible shiftings to tally for register at proximity between the portions; there is delicate accuracy. Accordingly in practice there may be a close set-up in disclosing black ring 26 (Fig. 10) for point location.

Readily read notations 27 (Fig. 11) may be shifted relative to a window 28, having fixed line or index 29, supplemented with the complementary black marker 30 with marginal gray regions 31, and a trailing horizontally extending dial region 32 of more heavy gray 33. Off-unit showing is clearly set forth by notation 34 (Fig. 12).

Notation carrying area 35 (Fig. 13) may be movable as to window 36 (Fig. 14) for a gray background 37 at which a notation 38 may be disclosed.

The granular-approaching refinement hereunder is light-ray handling wherein natural complemental areas or screens for affecting translucency, and including mutually interrelated or complemental pattern areas of materials having characteristics for complementary register. The bringing into register, say for an opaque appearance, may be had by pacing a pair of film transparencies having their complementary characteristics in adjacent parallel planes and turning one area angularly relatively to the other. With the characteristics that of Polaroid material, the shifting to a register may be at 90° from the full off or maximum out-of-register relation. At the register, say to disclose a character or outline, it may be opaque, as distinct from the greater translucency to be observed in departures therefrom.

As departing from the relatively straight line hand-produced figures or shapes (Figs. 4, 5) areas of asymmetrical patterns have been developed by reticulation. An instance thereof is worked out by slightly exposing to light a photographic film, then by hardening and softening with warm water treatment, the emulsion starts to creep on the film base and forms a pattern, in considerably enlarged outline 39 (Fig. 15). The practice as thus far used has required quite a few stages. However, one may take the pattern 39 as a positive for the dark or apaque portions, spaced by the light portions or transparencies 40; and therefrom work thru for a negative with light or transparent portions 41 and opaque portions 42 (Fig. 16). The identical register here of converse or complementary regions works toward opaque; for the similar patterns, of positive adjacent positive there is a rather heavy gray; while for a region of identity of positive with positive there is a lighter gray. This lighter gray would also follow for identity in a region of negative with negative.

The dial or tally markings 17 (Figs. 1, 2) have intermediate gaps or spacings. Considering the strip 11 is the negative, then the adjacent strip 15 is also negative but so continuous thruout. However, the strip 11, is made up of sections 43 (Fig. 17) from cut-out spacings 44 having the clearance between the markings 17 (Figs. 1, 2). On these respective areas of the sections 43, there may be cleared regions 9 (Fig. 6) for a notation character outline to have located therein a positive or reverse 10 (Fig. 7) thereof. As so completed, the sections 43, may be closed up to abut and thus omit the spacings 44. The assembly is the strip 11 as built up or with copies therefrom. The initial strips 11, 15 are of identical length and character thruout. When completed, the cut-down length strip 11, has its midpoint identical with the midpoint of the strip 15, which may then have its ends cut off, the equivalent of the removed portions 44 from the strip 11.

What is claimed and it is desired to secure by Letters Patent is:

1. The method of producing an indicator device, comprising forming a pair of elements with general view areas of substantially uniform appearance thruout consisting of minute opaque portions and substantially equal clear portions; forming the minute portions of each area within the outline of a desired character notation substantially complementary to each other; forming the remaining portions of said areas substantially non-complementary, whereby when said elements are superposed, with said character outlines coinciding, said character notation will appear sub-

stantially opaque and the remaining portions will be of contrasting appearance.

2. The method of producing an indicator device as recited in claim 1, wherein the general view area of one of said elements is formed by reticulation.

3. An indicating device comprising a pair of superposed relatively movable elements, each having a general view area of substantially uniform appearance throughout formed with minute opaque portions and substantially equal clear portions with the clear portions of at least the top member being transparent, the minute portions of each area, within the outline of a desired character notation being substantially complementary to each other, and the remaining portions of said areas being substantially non-complementary, whereby when said superposed elements are arranged so that said character notation outlines are superposed the character notation will appear substantially opaque and said remaining portions will be of contrasting appearance.

4. An indicating device as set forth in claim 3,

comprising a plurality of general view areas with individual character notation outlines adapted to be successively superposed.

RUSSELL P. TALBOT.

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