March 19, 1935. H. D. PAPE 1,995,036

INDEX DIAL PLATE

Filed Sept. 13, 1932

Fig. 1

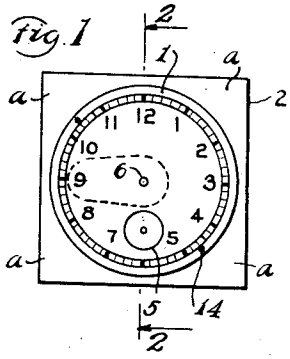


Fig. 2.

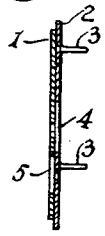


Fig. 3.

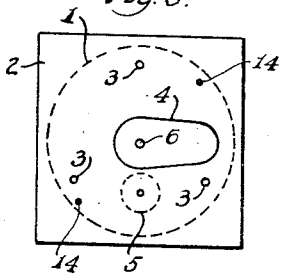


Fig. 4.

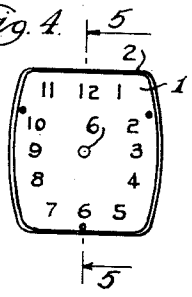


Fig. 5.

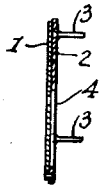


Fig. 6.

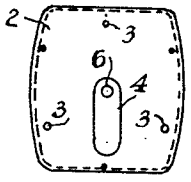


Fig. 7.

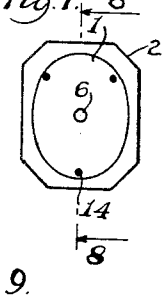


Fig. 8.

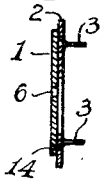


Fig. 11.

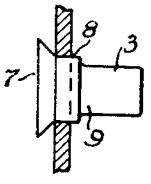


Fig. 12.

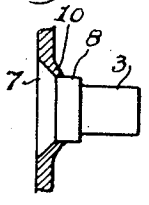


Fig. 9.

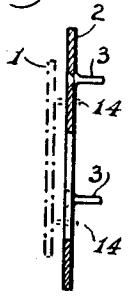


Fig. 10.

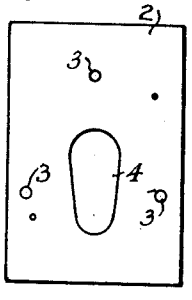
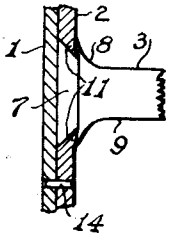


Fig. 13.



INVENTOR-
Herbert D. Pape
BY
Harold D. Penney ATTORNEY-

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INDEX DIAL PLATE

Herbert D. Pape, New York, N. Y., assignor to Premier Metal Etching Company, Long Island City, N. Y., a corporation of New York

Application September 13, 1932, Serial No. 632,887

12 Claims. (Cl. 58—127)

My present invention relates to an improvement in clock and watch dials, and has for its main object, the provision of a structure wherein the dials have, on the front face thereof, printed, etched or otherwise impressed time indices of the usual nature such as the hour, minute and second time divisions thereon, and by combining such a dial with a supplemental backing plate, thereby to form a complete dial. Various forms of backing plates may be used with the time indicating dials to fit square, polygonal, round or oval casing fronts, such backing plates being of a size normally larger than the time indicating dial itself. Thus a single, printed, etched or stamped dial face, may be used for a variety of time piece housings, the bezels of which vary in form, and for which bezel variations the contours of the backing plates are suitably designed to match.

The foregoing features, as outlined are extremely important in the economy effected, because as is well known in the clock or watch trades, the casings and appurtenant bezels, dial or bed-plate are all subject to varying modes of decoration, contour and structural details, while the principle of each horological device, of having an exposed indexed watch face is common to all.

Further, the use of a standard dial face on a supplemental backing plate to form a dual structure obviates the necessity of having too many types of indexed dial face plates, for use on time devices of many varying dial or bed-plate structures, thus obviating the cost of extra dies and other equipment.

A further object of the present invention is to provide a duplex dial and back-plate construction, in which the component thickness of the assembled members is equal to the single thickness of a standard dial, and to provide, in either or both of the component dial and backing plates stamped out openings which are closed, or overlaid by the associate member thereby to provide equivalent indentations, recesses or clearances heretofore milled into or routed out of dial plates of single thickness.

A further improvement herein lies in the use of a novel mode of affixing the duplex members together by the use of flush riveting, and the further provision of a novel method of affixing the bed-plate attaching studs to the backing plate before the finished dial plate is attached thereto.

These and other capabilities will be noted as the herein description proceeds, and it is obvious that modifications may be made in the structures herein disclosed, without departing from the spirit hereof or the scope of the appended claims.

In the drawing,

Fig. 1 is a front view of one form of my improved dial structure;

Fig. 2 is a sectional view thereof, taken on the line 2—2 of Fig. 1 looking in the direction of the arrows;

Fig. 3 is a rear view thereof;

Fig. 4 shows a front view of another form of dial;

Fig. 5 is a sectional view thereof taken on line 5—5 of Fig. 4, looking in the direction of the arrows;

Fig. 6 is a rear view thereof;

Fig. 7 shows a front view of another form of dial, the time markings being left off for convenience, the backing plate being of different form;

Fig. 8 is a sectional view of Fig. 7, taken on the line 8—8, Fig. 7, looking in the direction of the arrows;

Fig. 9 shows one form of mounting the dial face to its backing;

Fig. 10 shows one form of a backing plate having the appurtenant holes stamped therein, before attaching the rivets or dial plate; and

Figs. 11, 12 and 13 show certain sequences of applying the dial and bed plate studs to either the dial or backing plate.

Throughout the drawing the same indices are used to indicate like parts.

In Figs. 1 and 2, the composite dial is shown as comprising a front dial plate 1 having time indicating divisions on its exposed face, and being mounted upon a backing plate 2, the dial and backing plates having unlike contours, the dial 1 being circular while the backing plate 2 having angular portions *a—a*, is shown square. These members are assembled together as in Fig. 2, and either the dial plate 1 or the backing plate 2 may be provided with bed-plate attaching studs 3—3. In the making of the present novel dials, the material, preferably sheet metal, though not so limited, of which the component dials are made is only one half the thickness of the metal usually used for standard watch or clock dials, so that when the composite dials of the present improvement are finally assembled, they are no thicker than the dials of standard practice.

In Figs 1, 2 and 3 there will be noted a cut-out portion 5 on dial plate 1, and a cut-out portion 4 on backing plate 2. These cut-outs are blanked out of the respective plates, thus leaving opening 5 as a clearance recess for the second hand, not

shown, in the dial plate, and leaving opening 4, as a gear train clearance recess in backing plate 2, these recesses being completed when the backing plate and dial are assembled so that their respective uncut faces overlay the cut-outs when in assembled condition.

By this mode of using two plates to form a unitary dial, routing or milling these recesses therein as in a standard single dial is done away with. In standard dial structures of single stock, the stock is extremely thin, and the pressure of the milling or routing tool in milling out the recesses often causes a distortion of the dial plate faces at such points, and detracts from the appearance of the finished dial. In my present dual construction this distortion is entirely obviated and the plates forming the unitary dial are flat and unmarred.

The dial plate 1 is provided with an aperture 6 for the usual arbor of the timepiece mechanism, and in the backing plate 2 is an aperture, as shown, which communicates with the opening 5, for receiving the staff or arbor of said second hand. In order to cooperate with the aforesaid gear train, the recess 4 is elongate in form and one of its ends communicates with said aperture 6.

In Figs. 4 to 6 inclusive, is shown a dual plate dial similar in construction to the structures of Figs. 1 to 3, except that the form of dial and backing plate is different over those shown in the latter noted figures. In Fig. 6 a gear train clearance recess 4 is blanked out as described for Fig. 3, and this recess is overlaid by dial plate 1.

In Figs. 7—8 there is shown a dual dial plate structure, in effect, the same as that shown in Figs. 1 to 6 inclusive. Herein however there is shown an oval or elliptical dial with a polygonal backing plate. These latter views Figs. 4 to 8 inclusive are for the purpose of showing that three characteristic dials may be adopted as standard and as is obvious, any form of backing plate being fitted thereto as a bed-plate support so that only the backing plate is required to be varied for fitting it in assembly with the dial thereon to the desired watch or clock mechanism and its housing.

When a structure like that shown in Fig. 1 is used, the marginal or exposed portions of the backing plate 2 may be finished or decorated in a suitable manner.

In order that the backing plate 2 may be suitably affixed to the bed-plate, not shown, of a watch, or clock, in their cases, as is usual practice, studs 3 are, preferably, mounted upon the backing plate and anchored thereto by a special form of head-riveting fully shown in its sequential steps in Figs. 11 to 13 inclusive. In these last noted figures the backing plate 2 is provided with a bore in which the shoulder 8 of the stud 3 is inserted, the outer end of said shoulder having a countersunk terminal 7 thereon of larger diameter than the shoulder and thereby forming a head 7—8 upon one end of the shank 9 of stud 3.

In Fig. 11, the stud 3 is shown in the first step of assembly with plate 2. The next step is shown in Fig. 12, in which the head 7—8 is, by pressure, forced down until the top face of the tapered head 7 is flush with the face of plate 2. This causes a corresponding displacement of metal on the opposite side of plate 2, as at 10. After this, the final step of anchor-riveting is completed by either spinning or striking the end of shoulder 8 back towards the opposite face of plate 2, thus causing a taper interlock between the plate 2, and the heads 7 and 8, as at 11, Fig. 13. As thus completed the stud 3 is securely and smoothly anchored in plate 2.

Dial plate 1 may thereafter be affixed to the backing plate 2 by small pins or rivets 14, Figs. 3, 7 and 9, or in a manner similar to that described above, and as illustrated at 14, Fig. 9. Said pins, as shown, cooperate with the margin of the front plate, outside of the time graduations thereof.

After the complete fabrication of the dual dial with its studs therein, it is ready to be mounted by the studs 3 to a watch bed-plate in the usual manner. As the dual construction is no thicker than a single sheet standard dial, the present improved dial will fit the watch or clock mechanism without changes in the latter.

It will thus be seen, that, by the use of a dial plate and a backing plate, to form a unitary dial structure that a dial plate like 1, Fig. 1, may be fitted to different styles of backing plates, thereby permitting the use of a dial plate 1 upon many different styles of clocks or watches, thereby reducing the number of dies for indexing dial faces, and, at the same time providing for desired variant recess clearances at the front and rear of such unitary dual structures in a simple and practical manner.

Having thus described my invention what I claim is:

1. A unitary dial, comprising in combination an indexed dial plate, a backing plate therefor, the margins of said backing plate extending beyond the edges of said dial plate, said plates having blanked out openings therein, said openings being overlaid by unblanked portions of said plates to form clearance recesses on opposite sides of said plates.

2. A unitary dial comprising an indexed front plate, a backing plate therefor, means rigidly mounting said front plate to said backing plate, and bed plate attaching means carried by one of said plates, said bed plate attaching means comprising taper headed studs which are entered into bores in the backing plate, and which heads are then forced into a taper interlock with the backing plate, thereby to anchor said studs with their heads flush with one surface of the backing plate.

3. A dial for a timepiece including in combination a metal rear plate having a clearance opening therein for timepiece mechanism, a metal front plate including time indicating characters thereon, and rivets attaching said front plate to the rear plate whereby to substantially cover said opening.

4. A unitary dial for a timepiece including in combination a thin metal rear plate having an opening therein for timepiece mechanism, and a thin metal front plate substantially covering said opening.

5. A dial for a timepiece comprising in combination cooperating plates which include an outer plate having an arbor aperture, an inner plate having therein and distant from the first aperture another arbor aperture, each of said plates having therein and in communication with the aperture of the cooperating plate a relatively large opening, and means rigidly attaching said plates, said openings being non-communicating.

6. A timepiece dial including in combination a pair of plates which are rendered thin or reduced from the depth of standard plates; said thin plates having therein non-communicating openings, whereby an opening of each plate may be substantially covered by the material of the opposite plate, and means rigidly attaching said thin plates.

7. A dial for a timepiece including in combination a pair of metal plates which are rendered thin or reduced from the depth of standard plates, each of said thin plates having therein an opening which is substantially covered by the material of the opposite plate, studs projecting from one of said thin plates whereby to attach the dial to a timepiece bed plate, and fixed metallic attaching means for said thin plates.

8. A dial for a timepiece including in combination a pair of thin metal plates which are reduced from the depth of standard plates, said thin plates forming front and backing members and having therein non-communicating openings, so that the material of one member may substantially cover an opening of the other member; means for attaching the dial to a timepiece bed plate; said means including studs having rearwardly projecting stems, heads formed on said studs and attached to said backing member, and means metallically attaching said thin plates distant from said studs, whereby said front member may also cover said heads.

9. A dial for a timepiece including in combination a pair of thin metal plates which are reduced from the depth of standard plates; said thin plates including a front member and having time graduations thereon, a backing member having a margin extending beyond said front member, said members having non-communicating clearance openings therein, so that the material of one member may substantially cover an opening of the other member; means for attaching said dial to a timepiece bed plate; said means including studs having rearwardly projecting attaching stems, heads formed on said studs and attached to said backing member, and rivets attaching said thin plates distant from said studs, whereby said front member may also cover said heads.

10. A dial for a timepiece including in combination a thin front sheet of metal having a central arbor aperture, an endless line of time graduations around said aperture, an extended thin, metal backing sheet having a relatively large central opening, means passing through said backing sheet and attached thereto, said means extending rearwardly for joining the dial with the bed plate of a timepiece, said front sheet covering the attachment of said means, and relatively small metal members passing through said sheets and attaching the latter distant from said line and from said means, said members being disposed between the planes of the outer surfaces of said sheets.

11. A dial for a timepiece including in combination a front member of thin sheet metal, said member including time graduations and having a central arbor aperture, said member having a relatively large opening distant from said aperture; a backing member of thin sheet metal and having an arbor aperture cooperating with the opening of said front member, said backing member including an extended margin and having also a relatively large opening, which latter cooperates with the aperture of the front member, each of said openings adapted to provide a clearance for timepiece mechanism; and means rigidly attaching said members, so that the opening of each member may be bounded on one side by the material of the opposite member.

12. A dial for a timepiece including in combination a front plate having time graduations thereon, a backing plate having countersunk bores therein, means rigidly attaching said plates, and means for attaching said dial to a timepiece bed plate; said latter means including metal studs which cooperate with said bores; each of said studs including a rearwardly extending attaching stem, a tapered head engaged in a bore and having its end face engaged against the rear face of said front plate, and an annular shoulder integral with said stem at its head and engaging the rear face of said backing plate.

HERBERT D. PAPE.