Dec. 2, 1941. E. MORF 2,264,673

WATERTIGHT WATCHCASE

Filed April 12, 1940

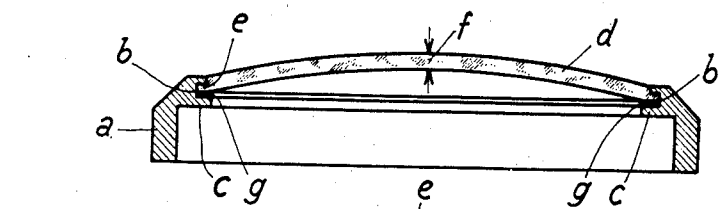


Fig. 1.

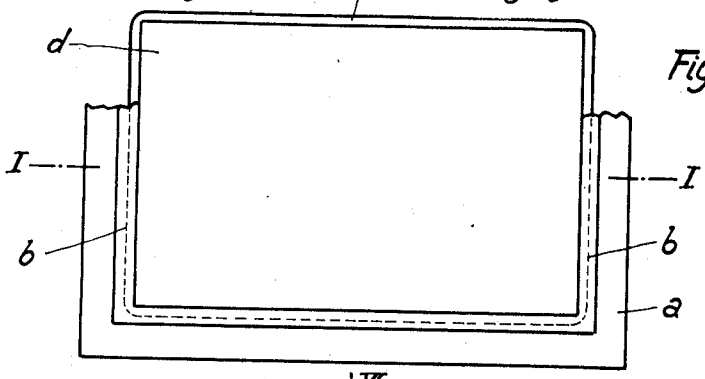


Fig. 2

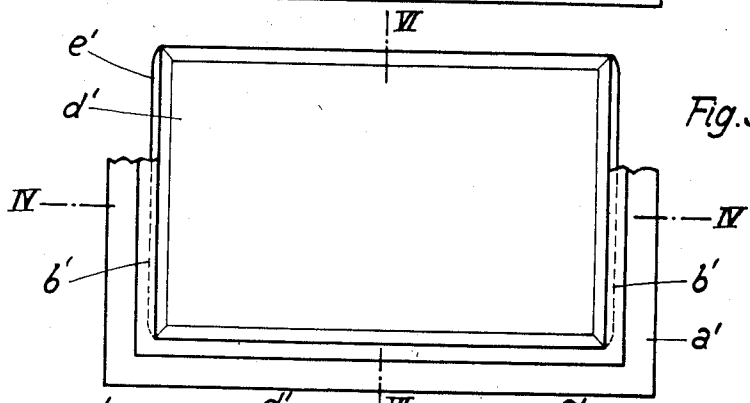


Fig. 3.

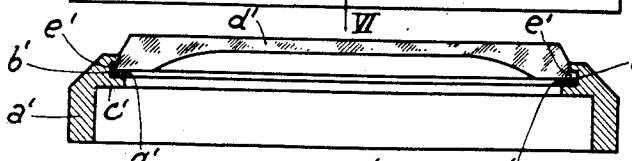


Fig. 4.

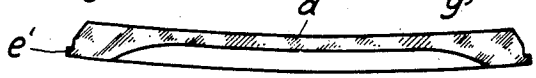


Fig. 5

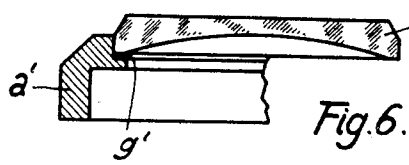


Fig. 6.

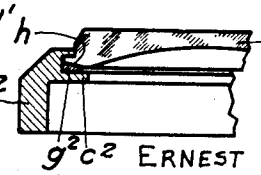


Fig. 7.

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WATERTIGHT WATCHCASE

Ernest Morf, La Chaux-de-Fonds, Switzerland

Application April 12, 1940, Serial No. 329,378
In Switzerland May 10, 1939

5 Claims. (Cl. 58—91)

The object of the present invention is a watertight watch-case, specially for fancy watches.

In most watertight watch-cases the crystal of compressible substance is clamped between parts of the case which are specially intended for this purpose. This manner of tightening was chosen after attempts had been made to render watch-crystals, mounted on the bezel by means of notches, watertight by introducing liquid glue between the walls of the notch and the crystal, with the object of filling up spaces which might exist between the crystal and the notch, and after experience had proved that, be it under the effect of dilatations or under the effect of accidental deformations of the bezel or the crystal, the glue scales off.

The simplicity of the fixing by means of notches is, however, indisputable and my invention is intended to obviate the above-mentioned inconveniences of the fixing by means of notches. I provide a packing pressed against a seat of the bezel by means of the edges of the elastically compressible crystal itself, which latter is held in a notch of the bezel. In this way the deformations of the crystal in any possible direction, as well as those of the bezel, have no influence whatever on the packing and this latter remains perfectly watertight as long as the crystal exists.

Other features of my invention will be apparent as the following description proceeds, reference being had to the accompanying drawing, in which,

Fig. 1 is a section taken on line I—I of

Fig. 2 which is a plan-view of a bezel partly cut away and provided with a curved crystal,

Fig. 3 is a view analogous to Fig. 2, but of another embodiment,

Fig. 4 is a section taken on line IV—IV of Fig. 3.

Fig. 5 is a so-called concave crystal, intended to be inserted into the bezel shown in Fig. 4,

Fig. 6 is a section taken on line VI—VI of Fig. 3,

Fig. 7 is a section of a modification of the embodiment shown in Fig. 4.

In the embodiment shown in Figs. 1 and 2 *a* is a bezel provided with a notch with rectangular cross-section, said notch extending over the whole circumference of the bezel and being limited at its lower end by a flange-shaped seat *c*. The crystal *d* of elastically compressible substance, for instance, of synthetic resin possesses a flange-shaped rim *e* on its whole circumference. With the exception of this rim *e* the crystal is everywhere of equal thickness *f*.

Under the flange-shaped rim of the crystal a compressible packing *g* of colorless, i. e., of transparent material is placed on the seat *c*. This packing is kept in place by the crystal itself because the flange-shaped rim *e* is thick enough, when inserted into the notch, to exert a perpendicular pressure on the packing, this pressure being sufficient to hold the packing fast in the notch and to press it against the flange *c*.

When mounting the crystal, it must be previously deformed in a small anvil made in two parts, the one part being convex, the other concave, to such an extent as to allow the edges of the crystal to pass the upper flange of the bezel and to enter the notch *b*. This deformation partially maintained when the crystal is in place, causes a certain tension which, on pressing the rim of the crystal against the seat, helps to tighten the joint.

In the embodiment shown in Figs. 3 to 6 it is the question of a so-called concave crystal d^1, that is, of a crystal whose edges are thicker than the middle part, which is made thinner in order to provide the necessary room for the hands. It is difficult to deform crystals of this kind so as to give them the form of a calotte as described with regard to Figs. 1 and 2. In order to mount crystals of this kind and, by their co-operation with the bezel a^1, to obtain a watch according to my invention, they have an initial curvature as shown in Fig. 5 and only the rims e^1 at the greatest distance from each other are flange-shaped. After having put the packing g^1 into place, an elastic bending of the crystal in the direction of the greatest length allows the flange-shaped rims e^1 to enter the notches b^1. The crystal being in place, the packing is firmly pressed against the seat d^1 by the rims of the crystal. The necessary pressure between the packing and the rim e^1 is obtained, in the same way as in the preceding embodiment, by a suitable thickness of the flange-shaped rims e^1, while the pressure between the packing and the other rims of the crystal is caused by the tension due to the curving of the crystal.

In the embodiment illustrated in Figs. 3 to 6, with the initial form of the crystal as shown in Fig. 5, a watch-case with a plane crystal is obtained. If a crystal curved in the direction of the greatest length is desired, the bezel must be provided with a corresponding curvature. In this case the initial form of the crystal is plane and the tension due to the bending of the crystal when in place presses those rims of the crystal, which do not co-operate with the notches, against the packing.

Fig. 7 shows a modification of the embodiment

represented in Fig. 4. The lower surface h of the crystal d^2, instead of being parallel to the flange, is inclined towards the center of the bezel a^2 and that over a width about equal to that of the water-tight joint. By this measure a bulging out of the packing, and, thereby, its becoming visible through the crystal, is avoided. This inclined surface presses the packing g^2 towards the seat c^2 and the outer wall of the notch. The crystal shown in Fig. 1 might also be provided with such an inclined lower surface.

Instead of notches with rectangular, those with rounded cross-section could be provided, or even those with a cross-section narrowing towards the notch-bottom.

While I have described and illustrated some embodiments of my invention I do not wish unnecessarily to limit the scope of this invention, but reserve the right to make such modifications as may come within the purview of the accompanying claims.

What I claim is:

1. In a watertight fancy watch-case, a bezel with short and long edges, a seat on said bezel, notches on said bezel and along the short edges of said bezel, a crystal of elastically compressible substance and with short and long edges, flange-shaped rims on the short crystal-edges, adapted to enter said notches, a packing of compressible material inserted between the lower surface of the crystal and said seat, said crystal, on mounting, being adapted to be deformed and, when mounted, to press the packing against the seat-parts lying along the long bezel-edges by means of the permanent tension caused by the deformation.

2. In a watertight fancy watch-case, a bezel with short and long edges, a seat on said bezel, notches on said bezel and along the short edges of said bezel, a crystal of elastically compressible substance and with short and long edges, flange-shaped rims on the short crystal-edges, adapted to enter said notches, a packing of compressible material inserted between the lower surface of the crystal and said seat, said crystal, on mounting, being adapted to be deformed in a direction opposite to its initial curvature and, when mounted, to be plane and to press the packing against the seat-parts lying along the long bezel-edges by means of the permanent tension caused by the deformation.

3. In a watertight fancy watch-case, a bezel with short and long edges, a seat on said bezel, notches on said bezel and along the short edges of said bezel, a crystal of elastically compressible substance and with short and long edges, flange-shaped rims on the short crystal-edges, adapted to enter said notches, a packing of compressible material inserted between the lower surface of the crystal and said seat, said crystal, on mounting, being adapted to be bent out of its initial shape and, when mounted, to be shaped correspondingly to the bezel seat and to press the packing against the seat-part lying along the long bezel-edges by means of the permanent tension caused by the bending.

4. In a watertight fancy watch-case, a crystal of elastically compressible substance, said crystal having the lower surface part of its rim inclined downwardly and toward the center of the watch-case, a bezel, a seat on said bezel, a notch on said bezel, adapted to hold the crystal, and a packing of compressible material, inserted between the inclined surface-part of the crystal and the said seat.

5. In a watertight watch case a bezel having a crystal receiving opening, a flange integral with said bezel extending inwardly of said opening at the lower portion of said opening to provide a crystal seat, the wall forming the boundary of said opening having a notch therein, the lower wall of the notch being co-extensive with the seat-forming flange and cooperating therewith to form said crystal seat, a crystal of an elastically compressible substance having a flange shaped rim inserted in said notch of the bezel, a packing of compressible material between said seat of the bezel and the lower side of the rim of the crystal, the lower side of said crystal rim tapering to a thin peripheral edge, and the packing having an inclined surface to cooperate with the inclined lower side of the crystal rim.

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