Jan. 12, 1943. F. MARTI 2,308,189

WATCHCASE

Filed Dec. 14, 1938 2 Sheets-Sheet 1

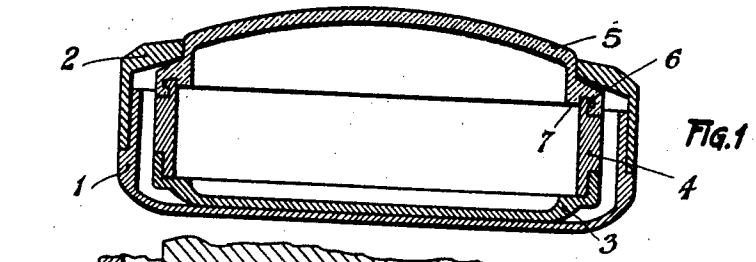


FIG. 1

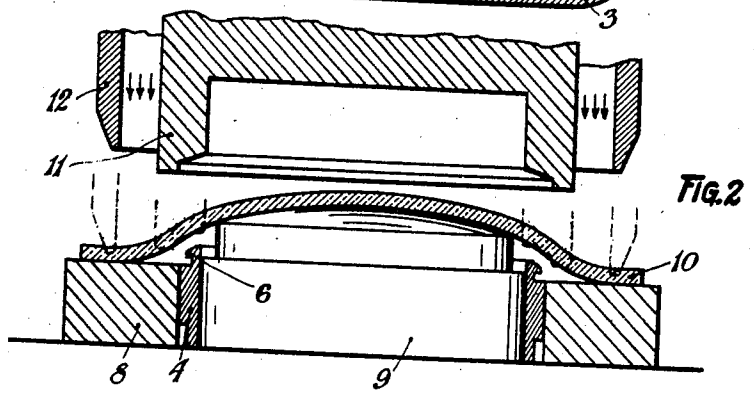


FIG. 2

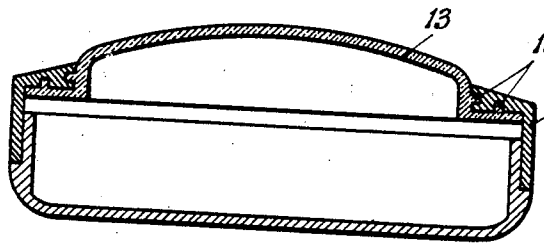


FIG. 3

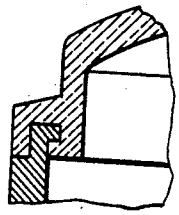


FIG. 4

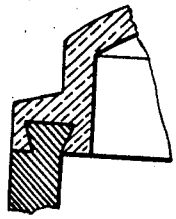


FIG. 5

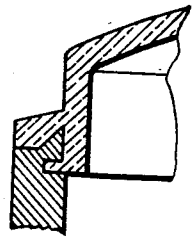


FIG. 6

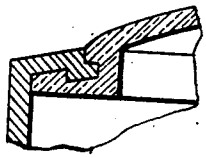


FIG. 7

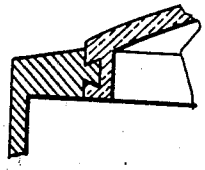


FIG. 8

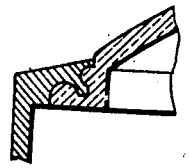


FIG. 9

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WATCHCASE

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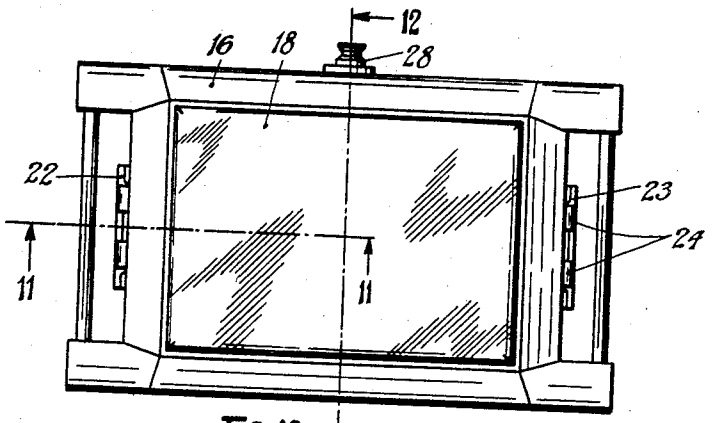


FIG. 10

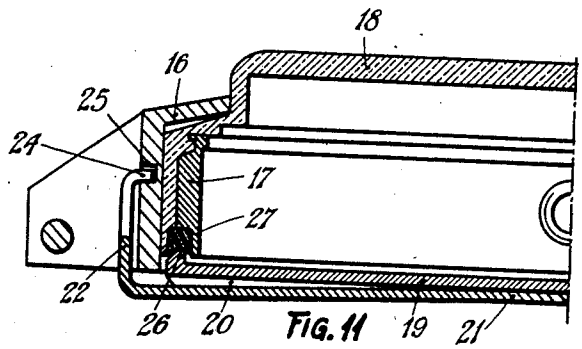


FIG. 11

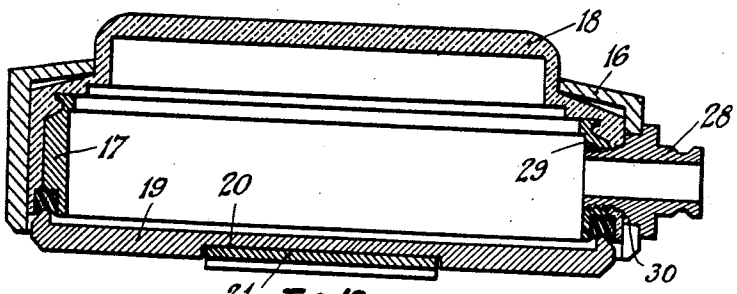


FIG. 12

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Patented Jan. 12, 1943 2,308,189

UNITED STATES PATENT OFFICE

2,308,189

WATCHCASE

Fritz Marti, La Chaux de Fonds, Switzerland

Application December 14, 1938, Serial No. 245,763
In Switzerland December 29, 1937

8 Claims. (Cl. 58—90)

This invention relates to watch cases and more particularly to the type of tight watch cases provided with unbreakable crystals and to a method for their manufacture.

The object of the invention is the provision of a watch case of the above type in which the unbreakable crystal is inseparably united under heat and pressure by an adhesive engagement to the portion of the case, which is destined to carry the crystal.

In method of manufacturing said watch case the crystal and the crystal carrying portion of the case, are both preliminarily heated, placed directly into contact with each other and pressed one against the other. This pressure is maintained until these two parts are cooled down.

The invention consists in the construction and arrangement and in the method for manufacture of certain parts of the watch case so that a watertight joint is effected, as will be apparent from the following description and claims, reference being had to the accompanying drawings which show several forms of embodiment of the present invention.

In the drawings,

Figure 1 is an axial section of a first embodiment.

Figure 2 illustrates the method for manufacture of this embodiment.

Figure 3 shows an axial section of a second embodiment.

Figures 4 to 9 inclusive are cross sections of modifications of details.

Figure 10 is a plan view of a third embodiment of oblong shape.

Figure 11 is a semi section along line 11—11 of Fig. 10.

Figure 12 is a section along line 12—12 of Fig. 10.

The embodiment represented in Fig. 1 comprises two elementary cases disposed one in the other; the external casing being constituted by a bottom 1 and a crystal frame 2, both of metal; the latter of said members being adapted to bear externally upon a crystal 5; the internal casing comprising a bottom 3, a movement ring 4 and the said crystal 5. This crystal is inseparately united under heat and pressure by adhesion to the movement ring 4, which dispenses with interposition of another substance, such as paste for instance. The movement ring 4 of metal presents a circular projection 6 which in radial cross section is broader at its end than at its base. This projection is engaged in a corresponding circular groove in the crystal in such a manner that the crystal and the movement ring cannot be separated but by destroying or melting the crystal. The latter presents on its border a shoulder 7 applied against the internal face of the border of the movement ring for absorbing the pressure which could be exerted on the crystal with a finger, for instance.

This case can be manufactured in the following manner:

The preliminarily heated movement ring 4 is placed in a mould formed of a wall 8 and of a core 9. A leaf of unbreakable crystal 10 preliminarily heated to a sufficiently high temperature so that it will be soft is then disposed on the upper surface of the core. Afterwards the piston 11 is lowered into the position shown in dash lines in Fig. 2, exerting a pressure on the soft leaf and thereby inseparably uniting by adhesion the crystal to the movement ring. This pressure is maintained until the two parts are cooled down. Instead of the piston 11, a cylinder 12 could be used by applying it against the leaf as in the position shown in dash lines in Fig. 2, and by introducing compressed air into the cylinder whereby the soft leaf of crystal would be applied against the movement ring.

The watch case shown in Fig. 3 is a single casing. The crystal 13 is fixed to the frame or case member 14 as above described, which means adhesively by heat and pressure. The crystal presents two circular projections 15 penetrating into the corresponding grooves of the frame or case member.

The Figures 4 to 9 inclusive are cross sections of modifications of these projections and grooves.

The third embodiment of the watch case represented in Figs. 10 to 12 is formed of an exterior casing constituted by a movement frame 16 of metal, and of an interior casing or case member. The latter comprises a metal ring 17 and an unbreakable crystal 18, the crystal 18 being fixed to the ring 17 over the entire width thereof by adhesion under heat and pressure and also by the mutual engagement of a peripheral projection on said ring and a corresponding groove in the crystal, thus effecting a solid and watertight joint between the two parts. The interior casing comprises moreover a metal bottom 19 presenting on its exterior face a longitudinal rectangular recess 20 wherein the median portion of a spring leaf 21 is placed. The two ends 22 and 23 of this spring are each bent at a right angle and are terminated by claws 24 engaged in grooves 25 of the movement frame 16.

The bottom 19 presents along the periphery of its internal face a projection 26, and between the

interior rims of the ring 17 and of the crystal 18 is a groove provided wherein a joint 27 of elastic material, plexigum for instance, is disposed.

In the position shown in the drawing the projection 26 is applied by means of the spring 21 against the joint ring 27, as at the same time the whole interior casing under the action of this spring is pressed against the top border of the movement frame 16, whereby an excellent tightness is obtained. Furthermore, the crystal 18 being fixed to the ring 17 over the entire width thereof, the two pieces constitute a very solid and watertight aggregate.

For the winding shaft a tube 28 is provided traversing two coaxial holes in the crystal 18 and the ring 17, the hole in the latter presenting a thread 29, whereinto the tube 28, threaded at its interior portion is screwed. A shoulder 30 provided on the tube presses then against the crystal so that a tight joint is obtained in this spot.

While the represented examples show some preferred forms of the invention, it is understood that other constructions and combinations of parts may be made which fall within the scope of the appended claims.

I claim:

1. In a tight watch case comprising an unbreakage crystal, a crystal carrying ring, said crystal being inseparably united under heat and pressure by adhesion to the ring over the entire width thereof for presenting a tight junction between said crystal and said ring, said crystal and said ring being provided with coinciding adjacent apertures, the aperture in the crystal being smooth and the aperture in the ring being threaded, a tube for the winding shaft, traversing said apertures, a circular shoulder round the exterior side of said tube, said tube being screwed into the threaded ring portion, so as to press the shoulder against the crystal.

2. In a tight watch case comprising an unbreakage crystal, a crystal carrying ring, said crystal being inseparably united under heat and pressure by adhesion to the ring over the entire width thereof for presenting a tight junction between said crystal and said ring, a groove between the bottom rims of said ring and said crystal, and a joint ring of elastic material disposed therein.

3. In a tight watch case, in combination a case member and an unbreakage crystal member, each having adjoining contact surfaces, and being inseparably united under heat and pressure by an adhesive engagement of their adjoining contact surfaces so as to form a watertight joint therebetween.

4. In a tight watch case, in combination a case member, an unbreakable crystal member, one of said members formed with at least one peripheral groove, the other of said members having at least one peripheral projection conforming to and fitting into said groove, said case member and crystal member having adjoining contact surfaces and being inseparably united under heat and pressure by adhesion of their adjoining contact surfaces and in particular by the mutual engagement of said groove with said projection so as to form a watertight joint between the case member and the crystal member.

5. In a tight watch case, in combination a case band having at its upper end a peripheral groove, and an unbreakable crystals formed with a downstanding flange adapted to contact with said case band over the entire width thereof and presenting a peripheral projection conforming to and fitting into said groove, said member and crystal being inseparably united by the adhesion of their adjoining contact surfaces and in particular by the mutual adhesive engagement of said projection with said groove so as to form a single watertight body.

6. A watch case of the character described comprising a casing, a grooved crystal carrying ring within said casing, an unbreakable crystal provided with a peripheral projection for engagement with the groove in said ring between said casing and said ring and adhesively contacting the adjacent side wall of the ring over the outer side surface thereof, a plate member underneath said ring formed with a longitudinal recess and an upstanding peripheral flange, a packing member between the lower peripheral abutting edges of said ring and said crystal upon which the said peripheral flange bears, and a spring leaf in the longitudinal recess of said plate extending exteriorly of the casing and removably engaged therewith to releasably hold the parts together.

7. A tight watch case including a case member and a bottom and side walls and shaped to receive the inner workings of a watch, an unbreakable crystal member adjacent said case member, each of said members having adjoining contact surfaces, one of said members having at least one peripheral groove, the other of said members having at least one peripheral projection conforming to and fitting into said groove, both of said members being inseparably united by heat and pressure at their adjoining contact surfaces and in particular by the mutual adhesion engagement of said groove with said projection so as to form a watertight joint between said case member and said unbreakable crystal member.

8. A watch case as claimed in claim 7, in which the opposed side walls of the peripheral groove are not parallel to each other.

FRITZ MARTI.