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Burkle

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[54] **WATCH CONSTRUCTION**

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[52] **U.S. Cl.** ..... **58/88 C;** 58/94

[51] **Int. Cl.**[2] **G04B 37/00;** G04B 37/04

[58] **Field of Search** ..... 58/88 C, 94

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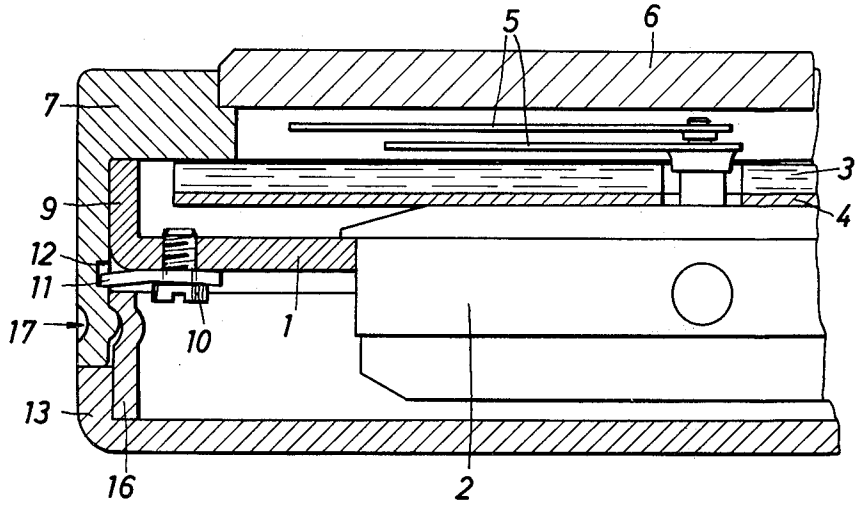
Attorney, Agent, or Firm—Walter Becker

[57] **ABSTRACT**

A watch construction having a watchwork holding ring for inserting from the rear a watchwork in a watch housing, in particular in a specially faced watch housing, which includes a backrest or upper housing section and a lower housing section, while the watchwork is covered by a fragile dial plate, especially a dial plate of precious stones and similar materials. The watchwork holding ring has at or near its rim portion associated therewith an elevation which is radially outwardly spaced from the dial plate and extends upwardly slightly beyond the watchwork with the dial plate while at the back side of the watchwork holding means are provided which fixedly hold the elevation associated with the watchwork holding ring against a step on the upper housing section or against abutment means in the upper housing section.

9 Claims, 5 Drawing Figures



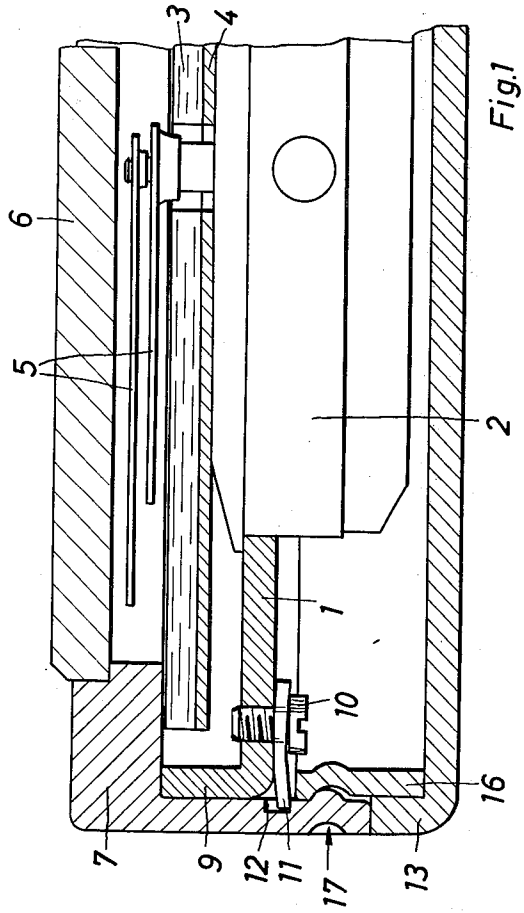


Fig.1

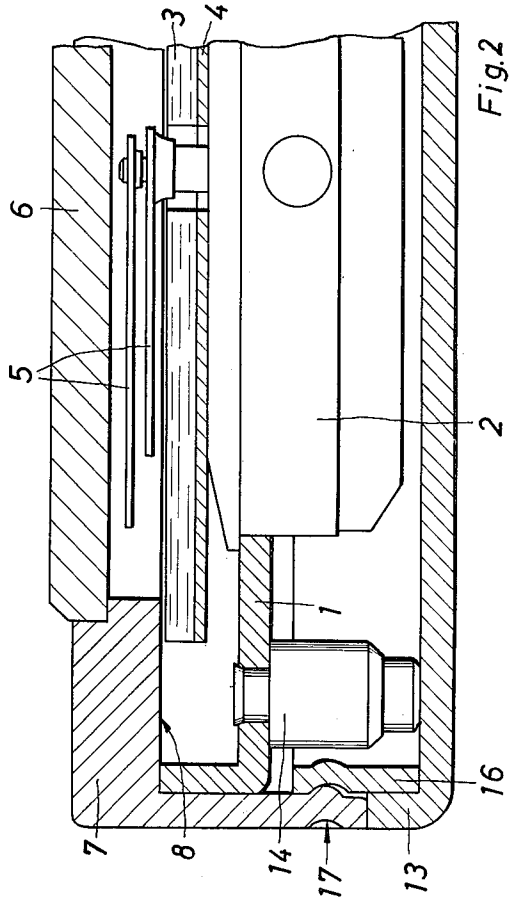


Fig.2

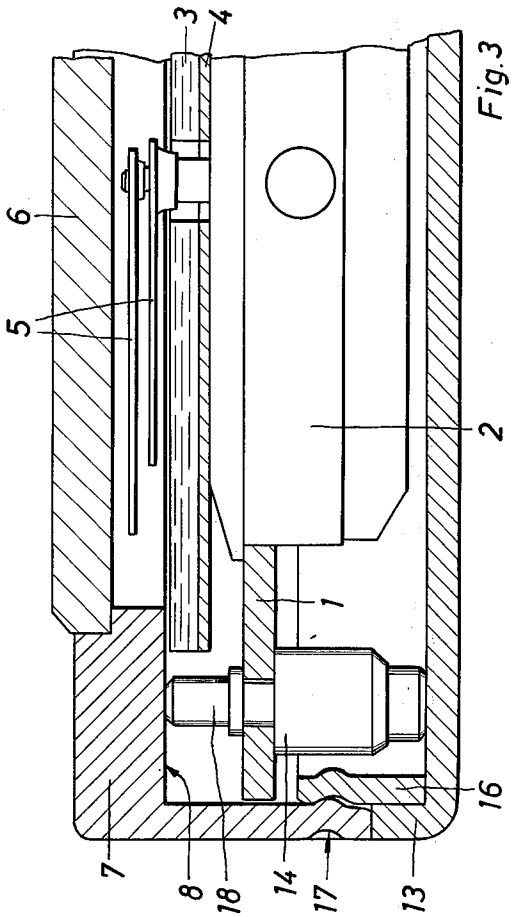


Fig.3

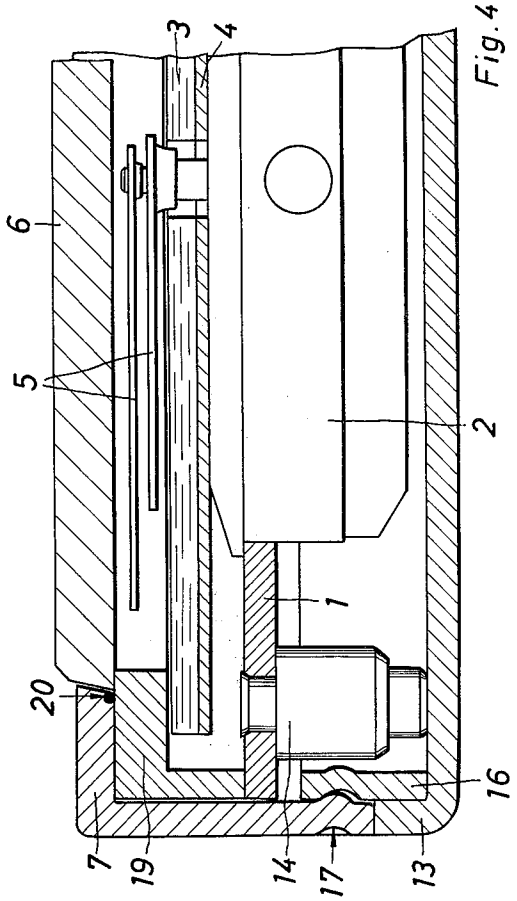


Fig. 4

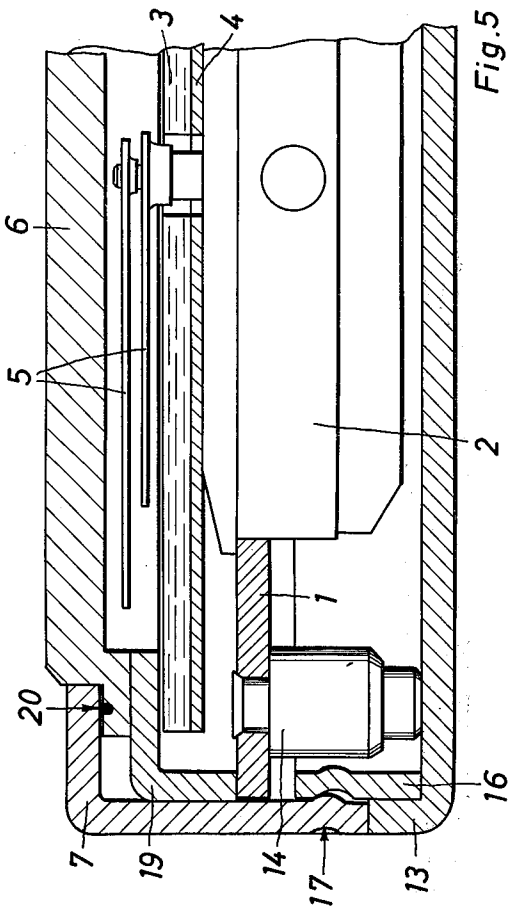


Fig.5

WATCH CONSTRUCTION

The present invention relates to a holding ring for inserting from the rear a watchwork into a watch housing, in particular a specially shaped watch housing, consisting of a backrest and a lower housing section, which watch housing is covered by a fragile dial plate, especially a dial plate of precious stones and similar materials.

Ornamental watches are, for emphasizing their ornamental character, frequently provided with dial plates of precious stones. In this connection a flat ground precious stone plate is provided instead of the usual metal dial plate, and the precious stone plate is either directly or through a metal base connected to the watchwork.

Precious stones and similar materials are generally very brittle and therefore extremely sensitive against bending. Some types of such materials are also very pressure-sensitive so that pressing as well as bending forces must under all circumstances be kept away from such materials.

Generally, this is realized by very precisely fitting the watchwork with its dial plate into the respective watch housing so that no undue stresses will occur in the dial plate while the watchwork and the dial plate are properly held in the watch housing.

A watch housing of ornamental watches generally differs in shape from the easily machined circular shape. Almost in all instances, in view of the desired appearance, specially shaped watch housings are employed which consist primarily of an upper housing part which forms the backrest and a lower housing part which by means of a closure ring is caused to spring into the lower housing part. To this end, it is customary to solder a watchwork frame into the lower portion of the housing into which frame the watchwork together with the dial plate is inserted whereupon the backrest is pressed on. It will be appreciated that the pressing on of the backrest and the connection of the lower housing part to the upper housing part has to be done very carefully in order not to assert pressure upon the dial plate of precious stone. By the shock encountered when snapping in the closure ring, the dial plate may be pushed against the holding means therefor to such an extent that it is destroyed or damaged, already when connecting the two parts. A further danger consists in that for opening the housing, which may become necessary several times in short succession for purposes of setting the watch, the two parts have to be separated from each other by laterally introducing a wedge, which fact may cause the lower portion of the housing to tilt relative to the upper portion of the housing. If this occurs, the watchwork fixedly connected to the lower portion of the housing and conseqnently also the dial plate connected thereto will be tilted which in turn may cuase undue high stresses in the dial plate and lead to breakage thereof.

The high breaking danger or at least the danger of damaging the dial plate has already caused various watch manufacturer to refuse any guarantee if the watch is opened by anybody but the manufacturer.

It is, therefore, an object of the present invention to provide a holding ring for a watchwork, which will overcome the above mentioned drawbacks.

It is another object of this invention to provide a holding ring as set forth in the preceding paragraph, which will permit closing and opening of the watch

housing without encountering any danger to the pressure and tension sensitive dial plate.

These and other objects and advantages of the invention will appear more clearly from the following specification in connection with the accompanying drawings, in which:

FIG. **1** shows a portion of a cross section through a first embodiment of the present invention.

FIG. **2** is a cross section similar to that of FIG. **1** but representing a second embodiment of the invention with spring bolts. FIG. **3** is a modification of the embodiment of FIG. **2.**

FIGS. **4** and **5** respectively illustrate further modifications of FIG. **2** with a pressure ring.

The above outlined objects have been realized according to the invention by providing the watchwork holding ring with an elevation arranged in the rim portion of said holding ring and surrounding the dial plate while extending slightly beyond the watchwork with the dial plate while holding means are arranged on the back side of said watch holding ring which connect said elevation to a stepped portion of the backrest. Thus, in contrast to heretofore known arrangements according to which the watchwork holding ring is fixedly connected in the form of a frame to the lower housing section, according to the present invention the holding ring forms a structural element by itself for receiving the watchwork with the dial plate and fixedly arranging said watchwork with the dial plate in the backrest. To this end, the rim portion of the watchwork holding ring is provided with an elevation, in its simplest embodiment with a flanged collar whereby a flat bowl or dish is formed in the bottom of which the watchwork is inserted and in which the dial plate is completely protected. This watchwork holding ring is then in any convenient manner pressed against a stop in the backrest for instance by holding screws or by spring bolts resting on the lower portion of the housing. At any rate, the watchwork with dial plate is not moved during the closing of the housing but it is previously unequivocably fixed on the backrest so that also the shock encountered during the closing of the housing can under no circumstances be transferred to the watchwork and thus cannot be conveyed to the dial plate. In this way it is possible without endangering the dial plate to close and open the housing so that the heretofore encountered difficult manipulations will no longer be necessary and the servicing of such watch, even with very sensitive dial plates, can be effected outside the manufacturing facilities of the watch manufacturer.

Instead of the described flanged collar, the above mentioned elevation may also be formed by spacer pins provided in the rim area. Furthermore, it is possible as spacer pins to insert adjusting screws in order to be able to set the distance of the holding ring according to the invention from the step of the backrest in conformity with the thickness of the dial plate, or to be able to adjust that portion of the watchwork including the dial plate which projects beyond the holding ring. Moreover, the spacer pins may be combined with the spring bolts while a fixed portion of the spring bolts is inserted between the holding ring and the backrest while the resilient part is provided between the holding ring and the bottom of the housing.

The elevation may also be formed by a pressure ring of L-shaped cross section which pressure ring rests on one hand on the holding ring and on the other hand on

the backrest. This embodiment has the economic advantage that the available tools for producing the watchwork holding ring may be further employed and that it is merely necessary to provide a pressure/punch tool for producing the pressure ring. Moreover, by employing such pressure ring there is obtained the possibility of pressing an annular seal between the watch crystal and the backrest into the seat for the seal so that this seal will also at extreme temperature variations always be pressed tightly between these parts.

Referring now to the drawings in detail, a watchwork **2** with a dial plate **3** containing precious stones is inserted into a watch holding ring **1.** The precious stone dial plate **3** is cemented onto a metal base **4.** Above the dial plate **3** there are provided the pointers **5.** Above the pointers **5** is arranged the covering watch crystal which is pressed into a backrest **7.** The watchwork holding ring **1** rests by means of a flanged collar **9** on a step **8** of the backrest **7.** The ring is held in its position by means of holding screws **10** clamping a clamping plate **11** into a groove **12** provided in the backrest **7.** A lower housing section **13** is placed upon the backrest **7** and held thereon by means of a nonillustrated customary closure ring.

As will be evident from the above, when placing the lower section **13** of the housing, the arrangement in the backrest **7** is not changed. The holding ring **1** which supports the watchwork **2** with dial plate **3** will by the holding means **10, 11, 12** be firmly fixed in the backrest **7.** In this way, also a possible closing shock occurring when the closure ring snaps in, cannot act upon the watchwork **2** and dial plate **3.** This arrangement is also well secured against shocks and blows acting upon the watch housing when the housing is closed. This is due to the fact that the clamping of the holding ring **1** in the backrest **7** is due to the holding means **10, 11, 12** so stable that shocks acting upon the housing can hardly, or at best, only greatly resiliently minimized, be conveyed to the watchwork **2** and dial plate **3.**

According to a second embodiment of the invention, the holding ring **1** is again with its flange collar **9** pressed against the step in the backrest **7,** but in this instance, through the intervention of spring bolts **14** is on one hand riveted onto the holding ring at **15** while resting on the other hand against the lower housing section. FIG. **2** shows the closing ring **16** engaging a bead section **17** of the backrest **7.**

It will be appreciated that with this embodiment an excellent safety arrangement against shock also with the housing in closed condition will be obtained because the holding ring **1** is always by the spring force of the spring bolt **14** firmly pressed against the step **8** in the backrest **7.**

According to the embodiment illustrated in FIG. **3** the holding ring **1** is riveted to the spring bolts **14** which, however, in the form of rigid spacer pins **18** determines the distance between the holding ring **1** and the step **8** of backrest **7.**

FIGS. **4** and **5** respectively illustrate plane watchwork holding rings having arranged thereon a pressure ring **19** of L-shaped cross section. This ring **19** rests on one hand on the holding ring **1** and on the other hand on a sealing ring **20** which is inserted in the backrest **7** between the watch crystal **6** and the backrest **7,** or rests on the inner side of the backrest **7** (FIG. **4**). In this way the seal **20** is always firmly pressed in its seat in backrest **7** or against the sealing surfaces between the watch crystal **6** and the backrest **7.** With this pressure ring **19** of L-shaped cross section, as illustrated in FIG. **5,** there is afforded the possibility of pressing on a sealing ring **20** with a watch crystal **6** of synthetic material while the seat of sealing ring **20** is inserted into the watch crystal **6.** However, the firm pressing on of the sealing ring **20** is effected through the intervention of the spring bolts **14** through the holding ring **1** and the pressure ring **19.**

It is, of course, to be understood that the present invention is, by no means, limited to the specific showing in the drawings but also comprises any modifications within the scope of the appended claims.

What I claim is:

1. A watch construction which includes: a watch housing having an upper housing section and a lower housing section, connecting means connecting said housing sections together, said upper section having an inner surface facing said lower section, a watchwork arranged within said housing, a holding ring supporting said watchwork, a dial plate mounted on said watchwork, spacer means associated with the radially outer portion of said holding ring and spacing said holding ring from said inner surface, at least a portion of said spacer means being located radially outwardly of said dial plate, and holding means holding said holding ring in a substantially constant position relative to said inner surface of said upper section, said spacer means being formed by upwardly directed marginal flange means of said holding ring, said flange means engaging said inner surface of said upper section, and said holding means including resilient means fastened to said holding means, said upper housing section comprising a skirt section surrounding said holding ring and having a recess engaged by said resilient means.

2. A watch construction according to claim **1,** in which one of said housing sections has a resilient snap extension and the other one of said housing sections has a portion complementary to said snap extension for engagement therewith.

3. A watch construction which includes: a watch housing having an upper housing section and a lower housing section, connecting means connecting said housing sections together, said upper section having an inner surface facing said lower section, a watchwork arranged within said housing, a holding ring supporting said watchwork, a dial plate mounted on said watchwork, spacer means associated with the radially outer portion of said holding ring and spacing said holding ring from said inner surface, at least a portion of said spacer means being located radially outwardly of said dial plate, and holding means holding said holding ring in a substantially constant position relative to said inner surface of said upper section, said spacer means including pin means having an upper section resting on and between said inner surface and said holding ring and also having a lower section resting on and between said holding ring and said lower housing section.

4. A watch construction according to claim **3,** in which said upper section of said pin means is adjustably screwed into said holding ring.

5. A watch construction according to claim **3,** in which said spacer means include spring bolts resting against said lower housing section and said holding ring.

6. A watch construction which includes: a watch housing having an upper housing section and a lower housing section, connecting means connecting said

housing sections together, said upper section having an inner surface facing said lower section, a watchwork arranged within said housing, a holding ring supporting said watchwork, a dial plate mounted on said watchwork, spacer means associated with the radially outer portion of said holding ring and spacing said holding ring from said inner surface, at least a portion of said spacer means being located radially outwardly of said dial plate, holding means holding said holding ring in a substantially constant position relative to said inner surface of said upper section, said outer housing section having a downwardly extending skirt, pointer means arranged above said dial plate, and a crystal glass arranged above said pointer means and having a marginal portion engaging said upper housing section, said spacer means including an annular member having a mantle portion resting on said holding ring while engaging said skirt and also having a portion substantially perpendicular to said skirt and engaging said crystal glass, said spacer means furthermore including pin means resting on said lower housing section and causing said holding ring to press said annular member against said crystal and thereby the latter against said upper housing member.

7. A watch construction according to claim **6,** which includes sealing ring means interposed between said crystal glass and a portion of said upper housing section.

8. A watch construction according to claim **7,** in which a rim portion of said crystal watch glass has an annular groove having said sealing ring means arranged therein.

9. A watch construction according to claim **7,** in which said portion of said upper housing section has an annular groove having said sealing ring means arranged therein.

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