Sept. 6, 1960 E. PIQUEREZ 2,951,332

WATCH PROVIDED WITH A MEMBER CONTROLLING ITS MOVEMENT AND INCLUDING A SECTION EXTENDING FLUID TIGHTLY INTO THE WATCH CASE

Filed May 10, 1955

3 Sheets-Sheet 1

FIG. 1

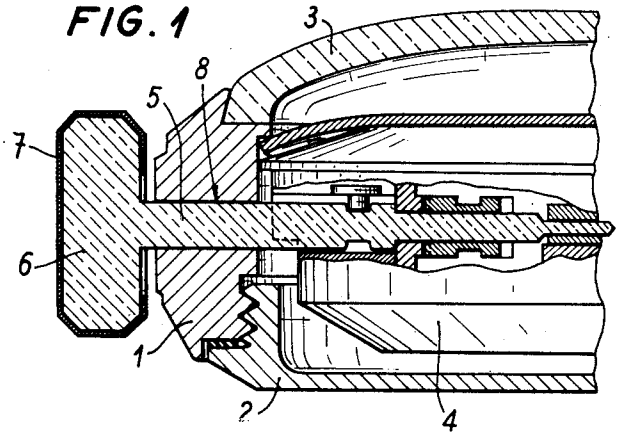
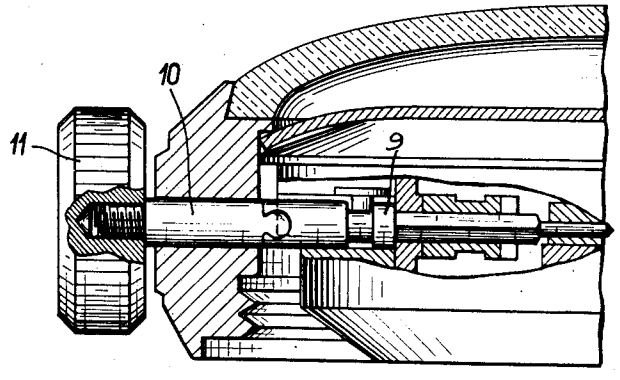


FIG. 2



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FIG. 3

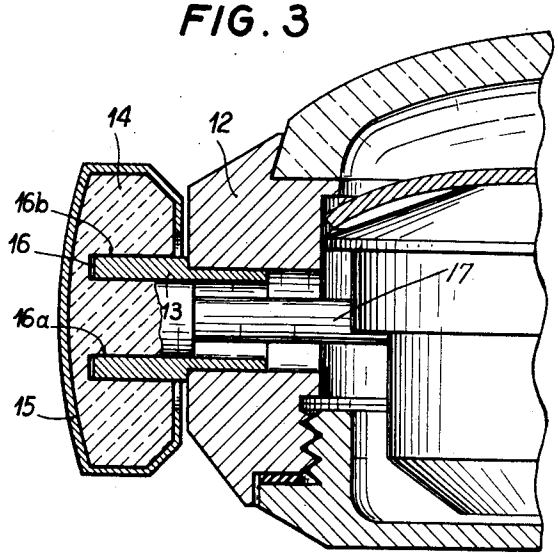
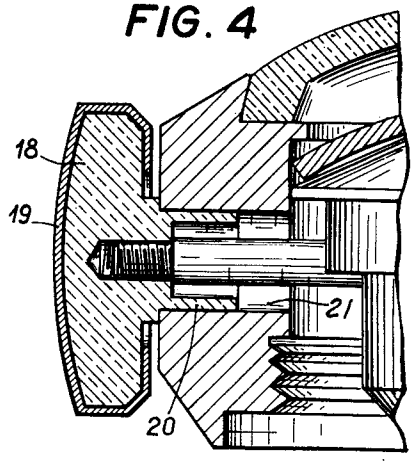


FIG. 4



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FIG. 5

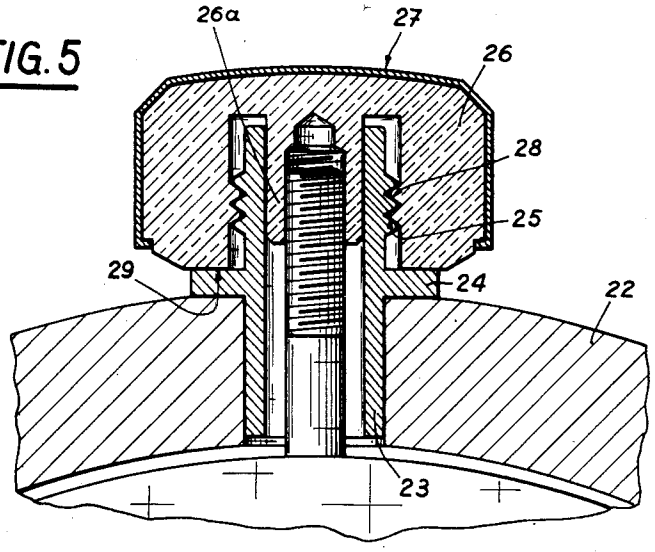
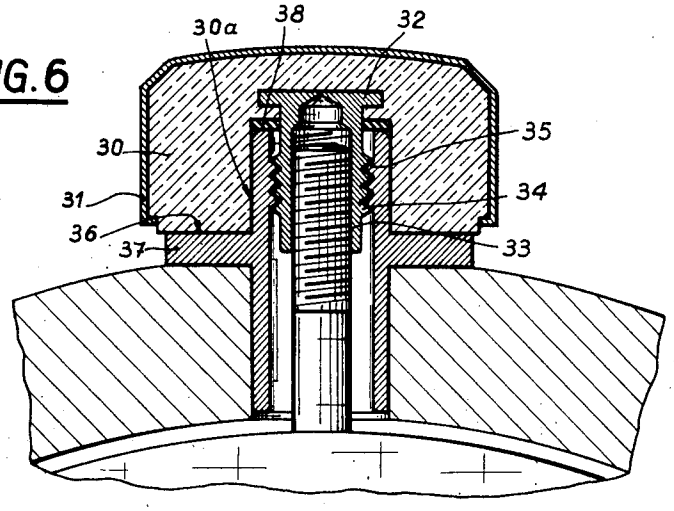


FIG. 6



United States Patent Office

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WATCH PROVIDED WITH A MEMBER CONTROLLING ITS MOVEMENT AND INCLUDING A SECTION EXTENDING FLUID TIGHTLY INTO THE WATCH CASE

Ervin Piquerez, Bassecourt (Jura Bernois), Switzerland

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16 Claims. (Cl. 58—90)

My invention has for its object a watch provided with a member controlling its movement and including a section passing fluid tightly into the case. According to my invention, the section of the above mentioned member which passes through the watch case is constituted by a non metallic compressible material forming a joint, without any other part being inserted therebetween, with the wall of the opening in the case through which the said section passes.

My invention is also applicable to the push button used for the operation of chronographs for instance.

I have illustrated by way of example in the accompanying drawing six embodiments of a part of a watch incorporating my invention. Each of Figs. 1 to 6 is a partial axial cross-section of a different embodiment associated with a portion of the watch carrying the control member.

The member controlling the movement inside the watch is constituted by a crown or winder button rigid with a winding up stem.

In the embodiment illustrated in Fig. 1, the fluidtight watch case includes an annular body **1** rigid with a rim, a bottom **2** screwed into the latter and a glass **3** fitted inside an annular notch in the rim of the body **1**. Inside the watch is secured the movement **4** while **5** designates the stem which serves for the winding up and for the setting of the watch. Said stem rigid with the crown **6** is made entirely together with the latter of a synthetic plastic material e.g. of a polyamidic type. It is possible to resort for instance to the well known polyamides sold under the registered trade names Nylon or Teflon; or else vinylic resins such as that sold under the registered trade name Plexiglas, polystyrene and the like may be used or again any other non metallic, compressible, elastic and fluidtight material. The crown **6** is coated by a metal film **7** so that its appearance does not jar with that of the case which is generally of metal. The section of the stem passing through the corresponding opening **8** in the annular body of the case forms a joint with the wall of said opening without any further material being required therebetween.

In the embodiment illustrated in Fig. 2, the stem of the winding means includes three sections of which the section **9** adapted to operatively engage the movement is made of metal while the section **10** extending through the opening in the case wall is made of a synthetic plastic material or the like and the crown **11** is made of metal or else of a synthetic material in which case it is advantageously in one with the intermediate section **10**.

Turning to Fig. 3, **12** designates a section of the wall of the watch case provided with the conventional pipe **13**. **14** designates the crown of the winding up means which is in one with the winding up stem **17**. This crown **14** is made of a synthetic plastic material such as for instance one of those referred to hereinabove; **15** designates a metal coat enclosing the parts of the crown which are apparent to the eye so that the appearance of the crown does not jar with that of the remainder of the case.

The crown is provided on its inner surface with an annular groove **16** inside which the pipe **13** is engaged. The size of these different elements are calculated so that either or both of the annular walls **16***a* and **16***b* defining the groove **16** form a joint with the cooperating surface of the pipe with which this or these walls are in contacting relationship, without it being necessary to insert any intermediate member between the pipe and the groove wall.

Turning to Fig. 4, **18** designates the crown of the winding up stem which is made entirely of the above mentioned material, said crown being coated again outwardly by a metal film **19** as precedingly. Said crown includes a sleeve **20** rigid therewith and made of the same material, said sleeve entering the opening **21** formed in the wall of the watch case so as to form a joint with said wall without any further part being required therebetween.

Obviously, the sleeve **20** which is again made of the above mentioned material may be fitted on the body of the crown which is then independent and may be made of metal.

The embodiment illustrated in Fig. 5 includes a pipe **23** fitted in the wall of the case **22**, said pipe being provided with an outer annular collar or flange **24** and with a threaded section **25** registering with the wall of the blind axial bore formed in the crown **26**. The latter is made of a synthetic plastic material of the above mentioned type and it is covered outwardly by a protecting metal cap **27**. Said crown is provided with a tapping **28** along the wall of its bore while its lower end forms an annular bearing surface **29**, engageable over the collar **24**. When the crown is inoperative i.e. when it is used neither for winding up nor for setting the watch right, the crown is screwed over the pipe **23** illustrated in Fig. 5. The bearing surface **29** on the crown engages then operatively the outer surface of the flange **24** without the interposition of any further member and cooperates with said flange to form a joint. The tubular part **26***a* projecting inside the bore in the crown forms a further joint with the inner wall of the pipe **23**.

In the last embodiment illustrated (Fig. 6), the crown **30** which is again made of compressible non metallic material such as a polyamide is also coated with a metal protecting cap **31**. The crown is inwardly reinforced by a metal socket **32** provided with an inner and an outer thread respectively shown at **33** and **34**. The inner thread **33** engages the thread on the winding up stem while the outer thread **34** engages, when the crown is inoperative, the tapping formed inside the pipe **35**.

In this position, the bearing surface **36** at the lower end of the crown forms a joint with the collar or flange **37** on the tube **35** without any intermediate part being required therebetween. The wall of the blind bore in the crown may also form a joint at **30***a* with the outer wall of the pipe **35**. Lastly the crown **30** engages with the interposition of a packing, the flat surface **38** forming the terminal section of the pipe inside the bore of the crown so as to form on this area a further fluid tight joint. It is also possible to resort to said last mentioned joint as the only joint and to omit that between the flange **37** and the bearing surface on the crown at **36**.

What I claim is:

1. In a watch, the combination of a case provided with an opening, a movement inside the latter, a stem controlling said movement, made of a non metallic compressible material fluid-tightly engaging in direct contacting relationship the wall of the opening in the case and a crown controlling the outer end of said stem to make said stem slide and revolve inside the opening.

2. In a watch, the combination of a case provided with an opening, a movement inside the latter, a wind-

ing up stem including a medial section made entirely of a non metallic compressible material, said stem being operatively connected with the movement of the watch and the medial section of said stem engaging fluidtightly in direct contacting relationship the wall of the opening in the case and a crown controlling the rotary and sliding movements of the winding up stem.

3. In a watch, the combination of a case provided with an opening, a movement inside the latter, a crown slidably carried by the case in register with the opening therein, said crown including an outer metal section and a sleeve of a compressible non metallic substance fluidtightly engaging in direct contacting relationship the wall of the opening in the case and a stem revolvably and slidingly extending through the opening in the case and through which the crown controls the movement in the case.

4. In a watch, the combination of a case provided with an opening, a movement inside the latter, a pipe fitted in the opening of the case and provided with a transverse outwardly facing bearing surface, a crown provided with an axial blind bore fitted over the pipe, said crown including a section facing the case opening, made of a compressible non metallic substance and forming an annular bearing surface adapted, upon urging of the crown downwardly over the pipe, to form a fluidtight joint through direct engagement with the annular bearing surface on the pipe and a stem revolvably and slidingly extending inside the opening and operatively connecting the crown with the movement.

5. In a watch, the combination of a case provided with an opening, a movement inside the latter, a pipe fitted in the opening of the case and including an outer shoulder the surface of which facing away from the case forms a bearing surface, a crown provided with an axial blind bore fitted over the pipe, said crown including a section facing the case opening, made of a compressible non metallic substance and forming an annular bearing surface adapted, upon urging of the crown downwardly over the pipe, to form a fluidtight joint through direct engagement with the annular bearing surface on the pipe and a stem revolvably and slidingly extending inside the opening and operatively connecting the crown with the movement.

6. In a watch, the combination of a case provided with an opening, a movement inside the latter, a pipe fitted in the opening of the case and provided with an outer terminal cross-section forming a bearing surface, a crown provided with an axial blind bore fitted over the pipe, said crown including a section registering with the bore, made of a compressible non metallic substance and forming an annular bearing surface adapted, upon urging of the crown downwardly over the pipe, to form a fluid-tight joint through direct engagement with the annular bearing surface on the pipe and a stem revolvably and slidingly extending inside the opening and operatively connecting the crown with the movement.

7. In a watch, the combination of a case provided with an opening, a movement inside the latter, a pipe fitted in the opening of the case and provided with a transverse outwardly facing bearing surface, a crown provided with an axial blind bore threadedly engaging the pipe, said crown including a section facing the case opening, made of a compressible non metallic substance and forming an annular bearing surface adapted, upon screwing of the crown downwardly over the pipe, to form a fluidtight joint through direct engagement with the annular bearing surface on the pipe and a stem revolvably and slidingly extending inside the opening and operatively connecting the crown with the movement.

8. In a watch, the combination of a case provided with an opening, a movement inside the latter, a tapped pipe fitted in the opening of the case and provided with a transverse outwardly facing bearing surface, a crown provided with an axial blind bore and including a section

facing the case opening made of a compressible non metallic substance and forming an annular bearing surface, a tapped metal socket coaxially embedded inside the crown, projecting through its open end into the blind bore thereof and provided with an outer thread, the outer thread of the socket engaging the tapping on the pipe, said crown and socket being adapted when screwed downwardly over the pipe to form a fluidtight joint through direct engagement with the annular bearing surface on the pipe and a winding up stem threadedly engaging the tapping in the socket and controlling the movement of the watch through a rotary and sliding motion inside the case opening.

9. In a watch, the combination of a case provided with an opening, a movement inside the case, a member controlling the movement in the case and including a crown and a stem angularly rigid therewith and adapted to move slidably and to turn with reference to said opening, at least one of said parts, the crown and the stem, including a section bearing directly against the surface of said opening in the case and constituted, throughout its cross-sectional area, of a compressible non-metallic material.

10. In a watch, the combination of a case provided with an opening, a pipe rigidly fitted inside said opening and projecting beyond same, a movement inside the case, a crown revolubly and slidingly fitted in direct contacting relationship over said pipe and made throughout its cross-section engaging said pipe of a non-compressible synthetic plastic material and a stem rigid with said crown projecting through the opening and the pipe thereon and controlling the movement.

11. In a watch, the combination of a case provided with an opening, a movement inside the case, a crown including a body entirely made of non-metallic compressible material fitted revolubly and slidingly in said opening in direct contact relationship with the latter and a stem rigidly secured to said crown and extending revolvably and slidingly inside said opening and controlling the movement.

12. In a watch, the combination of a case provided with an opening, a movement inside the case, a member controlling the movement in the case and including a crown and a stem angularly rigid therewith and adapted to move slidably and to turn with reference to said opening, said member including a section made throughout of a synthetic compressible material and engaging directly the wall of the opening.

13. In a watch, the combination of a case provided with an opening, a movement inside the case, a member controlling the movement in the case and including a crown and a stem angularly rigid therewith and adapted to move slidably and to turn with reference to said opening, the stem including a section bearing directly against the surface of said opening in the case and constituted, throughout its cross-sectional area, of a compressible non-metallic material.

14. In a watch, the combination of a case provided with an opening, a pipe rigidly fitted inside said opening and projecting beyond same and including an outer flange, a movement inside the case, a crown revolubly and slidingly fitted in direct contacting relationship over said pipe and the outer surface of the flange of the pipe and made throughout its cross-section engaging said pipe of a non-compressible synthetic plastic material and a stem rigid with said crown and projecting slidingly and revolvably through the opening and the pipe thereon and controlling the movement.

15. In a watch, the combination of a case provided with an opening and including an element having a cylindrical bearing surface coaxial with the opening, a movement inside the case, a member controlling the movement in the case and including a crown and a stem angularly rigid therewith and adapted to move slidably and to turn with reference to said opening, at least one of said parts, the crown and the stem including a section bearing directly against a cylindrical surface coaxial with the open-

ing in the case and constituted throughout its cross-sectional area of a compressible non-metallic material.

16. In a watch, the combination of a case provided with an opening, a movement inside the case, a member including a crown and a stem angularly rigid therewith and slidingly and revolubly carried by the case in the opening therein, to control the movement in the case, said member including a section fluidtightly mounted on the case through a bearing surface coaxial with the opening and made entirely of a compressible non-metallic material.

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