

July 21, 1925.

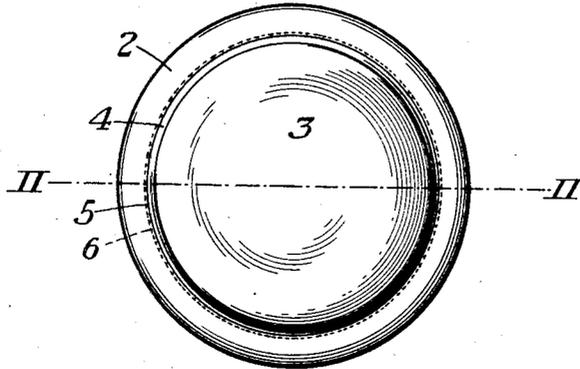
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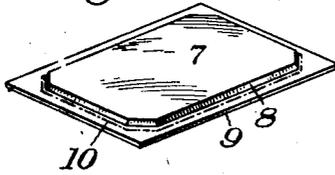
WATCH CRYSTAL

Filed Jan. 17, 1925

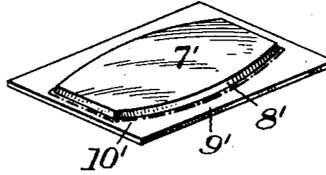
*Fig. 1.*



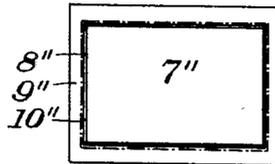
*Fig. 3.*



*Fig. 4.*



*Fig. 5.*



INVENTOR

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# UNITED STATES PATENT OFFICE.

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## WATCH CRYSTAL.

Application filed January 17, 1925. Serial No. 3,089.

*To all whom it may concern:*

Be it known that I, ALEXANDER FRIEDMAN, a citizen of the United States, residing at Pittsburgh, county of Allegheny, State of Pennsylvania, have invented a new and useful Improvement in Watch Crystals, of which the following is a full, clear, and exact description.

The present invention relates to watch crystals, and more particularly to watch crystals of celluloid or like material, which are ordinarily known as unbreakable watch crystals. Heretofore, these watch crystals have been made either flat or slightly convex and have been sprung into the groove of the bezel of the watch. This is ordinarily accomplished by clamping the crystal between male and female dies shaped to increase the convexity of the crystal sufficiently to allow it to slip into the groove of the bezel and then releasing the crystal gradually from the clamping pressure of the dies, whereupon the crystal, in tending to assume its normal shape, makes a tight fit in the groove of the bezel. By bending up the crystal and fitting it in the bezel, the crystal is placed under tension and its tendency to unbend and force the edges thereof outwardly is depended upon to hold the crystal in the bezel. Under the heat of the body, a crystal secured and held in place in this manner tends to lose its spring and to warp, thereby increasing its deformation due to the bending up of the crystal in placing it in the bezel so that the crystal becomes loose in the bezel, and if it does not actually drop out, dirt is allowed to sift into the watch casing around the loose edges of the crystal.

In accordance with the method of my present invention I form a watch crystal of the unbreakable type by taking a flat blank of material, such as celluloid, and molding it between heated dies so as to produce a raised or embossed body portion having a permanent downwardly extending and preferably outwardly inclined peripheral shoulder terminating in an outwardly extending bezel-engaging edge portion off-set into a plane below the raised or embossed body portion of the crystal by said permanent shoulder. This gives the body portion of the crystal a dome shape which, with the permanent shoulder adjacent the edge of the crystal, gives more space beneath the crystal, so that the ends of the watch hands do not have to

be bent over towards the face of the watch, and gives more space for the free movement of the hands. The width of the outwardly extending edge portion will be determined by the size of the particular watch with which the crystal is to be employed, and will be trimmed accordingly, and since the crystal is molded to permanent shape, it does not depend upon being sprung into place to hold it in the bezel. Furthermore, by reason of the permanent shoulder, and also by reason of the fact that the body portion of the crystal is molded substantially flat and under heat, the heat of the body does not affect the crystal so as to cause it to become loose and drop out of the bezel.

The nature of my invention will be more fully understood by reference to the accompanying drawings, in which:—

Figure 1 is a plan view of the bezel of an ordinary round watch having a crystal embodying my invention;

Figure 2 is a section on the line II—II of Figure 1, and

Figures 3 and 4 are perspective views and Figure 5 a plan view of different shapes of crystals embodying my invention and adapted for use with wrist watches, these last three figures showing the crystals complete except for the final step of trimming their edge portions to the desired width to fit the bezels of the watches with which they are to be employed.

Referring to Figures 1 and 2, 2 designates the bezel of an ordinary round watch and 3 the crystal, which will ordinarily be of celluloid. The crystal is molded so as to have a slightly convex body portion and a downwardly extending and outwardly inclined peripheral shoulder 4. This shoulder terminates in an outwardly extending bezel-engaging edge portion 5 which is off-set by the shoulder 4 into a plane below the dome-shaped body of the crystal. This edge portion is trimmed to the proper width so as to enable it to snap into the groove 6 of the bezel.

Figures 3, 4 and 5 illustrate crystals for wrist watches at one stage of their process of manufacture, namely, before the final step of trimming their bezel-engaging edge portions. Since the crystals shown in these three figures merely differ from each other in shape, a description of the process of manufacturing the crystal shown in Figure

3 will suffice. This crystal is made by taking a blank of celluloid or similar material and molding it between heated dies to give it the shape shown. It has the raised or embossed substantially flat body portion 7, the peripheral shoulder 8 and the flange 9 off-set below the raised body portion by the shoulder 8. This flange is adapted to be trimmed to the desired width, as, for example, along the dotted line 10, to provide the bezel-engaging edge portion of the proper width to fit the particular size of wrist watch with which the crystal is to be employed.

The process of manufacturing the crystals shown in Figures 4 and 5, as already stated, is the same as the process of making the crystal shown in Figure 3. In Figures 4 and 5 the parts corresponding to the parts of Figure 3 are designated by the same reference numerals with a prime affixed in the case of Figure 4 and a double prime affixed in the case of Figure 5.

The above examples are simply illustrative of my invention, it being apparent that the invention is not confined to any particular shape of crystal.

I claim:

1. A watch crystal of the unbreakable type having a body portion, and a permanent downwardly extending peripheral shoulder terminating in an outwardly extending bezel-engaging edge portion, the free edge of which is adapted for insertion in the groove in the inner edge of a bezel without any substantial distortion of said body portion; the offsetting of said body portion from said edge portion by said shoulder providing additional space between said body portion and the watch dial for

the free movements of the watch hands, substantially as described.

2. A watch crystal of the unbreakable type having a body portion which is substantially unaffected by ordinary temperature changes, and a permanent downwardly extending peripheral shoulder terminating in an outwardly extending bezel-engaging edge portion, the free edge of which is adapted for insertion in the groove in the inner edge of a bezel without any substantial distortion of said body portion.

3. A watch crystal of the unbreakable type having a heat-treated body portion which is substantially unaffected by ordinary temperature changes, and a permanent downwardly extending peripheral shoulder terminating in an outwardly extending bezel-engaging portion, the free edge of which is adapted for insertion in the groove in the inner edge of a bezel without any substantial distortion of said body portion.

4. A watch crystal of the unbreakable type having a body portion, and a permanent downwardly extending and outwardly inclined peripheral shoulder terminating in an outwardly extending bezel-engaging edge portion, the free edge of which is adapted for insertion in the groove in the inner edge of a bezel without any substantial distortion of said body portion, the offsetting of said body portion from said edge portion by said shoulder providing additional space between said body portion and the watch dial for the free movements of the watch hands, substantially as described.

In testimony whereof I have hereunto set my hand.

ALEXANDER FRIEDMAN.