Feb. 21, 1950

R. FEURER

2,497,935

DUST-TIGHT WATCH CROWN

Filed July 11, 1947

Fig. 1.

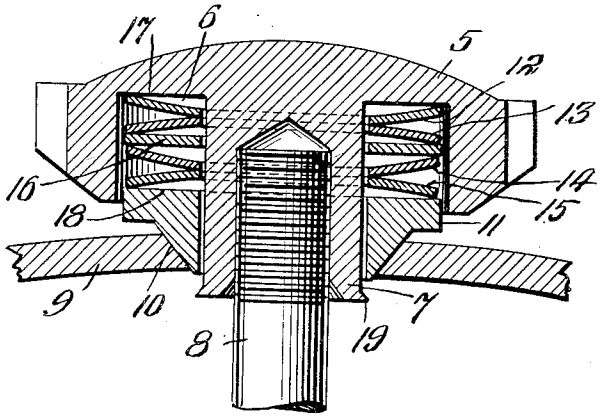
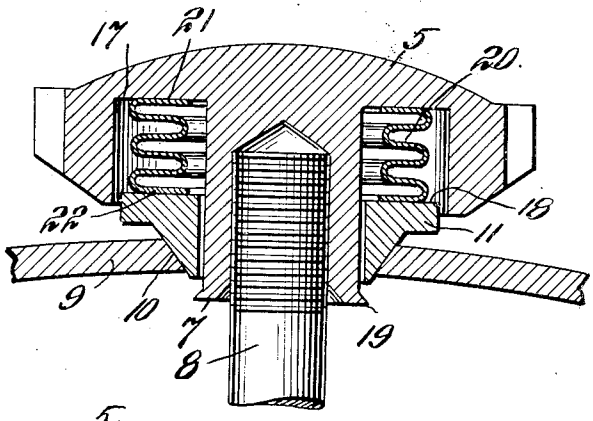


Fig. 2.



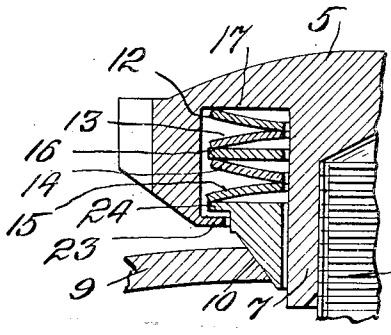


Fig. 3.

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Patented Feb. 21, 1950

2,497,935

UNITED STATES PATENT OFFICE

2,497,935

DUST-TIGHT WATCH CROWN

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Application July 11, 1947, Serial No. 760,387

1 Claim. (Cl. 58—90)

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The invention disclosed in this patent application relates to watch crowns and the main object of the invention is to provide a simple, practical and thoroughly reliable dust-tight connection between the crown and the case of a watch.

Particular objects of the invention are to provide such structure in a form which will adapt itself to various angles and degrees of eccentricity between the watch stem and case to maintain a perfect seal and proper operating relations under all such circumstances.

Special objects of the invention are to accomplish all the foregoing in a simple, inexpensive construction, compact and small, so as to be accommodated within small ornamental crowns.

Other special objects are to accommodate the sealing means all within the body of the crown and to confine such means to the crown when the latter is removed from the winding and setting stem.

Further objects of the invention are to reduce the number of essential parts and to accomplish this by combining a portion of the sealing functions with the spring for maintaining the seal in the self-adjusting, closed relation.

Other desirable objects and the novel features through which the purposes of the invention are attained are set forth or will appear in the course of the following specification.

The drawing accompanying and forming part of the specification illustrates certain present practical embodiments of the invention. Structure, however, may be modified and changed as regards the immediate illustration, all within the true intent and broad scope of the invention as hereinafter defined and claimed.

Figure 1 in the drawing is a broken cross sectional view illustrating one form of the new self-adjusting and self-sealing watch crowns as applied to a watch stem and cooperating with a watch case;

Fig. 2 is a similar view of another form of the invention;

Fig. 3 is a broken sectional detail of a modification.

As appears in the several views, the watch crown 5 of the present invention is made with a relatively deep annular cut 6 to contain the sealing means, and with a central tubular projection 7 internally screw threaded to be removably engaged with the correspondingly screw threaded winding and setting stem 8.

The wall 9 of the watch case is made with an opening considerably larger than the stem and

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this opening is beveled as represented at 10, to form a seat for a correspondingly beveled or tapered sealing washer 11 loosely surrounding the tubular stem 7 and loosely received in the annular chamber 6 in the crown. This looseness is such as to permit the sealing washer to adjust itself to various degrees of eccentricity and relative angularity between the case and stem, so that the washer may adjust itself to a proper sealing fit in the watch case opening 10, despite any off-center position of the stem or out of true angularity between stem and case.

A definite seal is provided between the crown and the back of the beveled washer and this seal is, in effect, the spring for maintaining the washer in its self-adjusted sealing engagement with the case.

In Fig. 1 the combination sealing spring consists of four dished or conical spring washers 12, 13, 14, 15, arranged in pairs and with a flat spring washer 16 between such pairs.

The spring washers of each pair are arranged back to back with their inner edges in contact and their outer edges engaged, respectively, with the back wall 17 of the annular cavity in the crown and with the outer edge portion of the intermediate flat washer 16.

The individual spring washers 14, 15, of the inner pair are similarly disposed back-to-back with their inner edges in contact and their outer edges engaged with the intermediate flat washer 16 and with the flat back face 18 of the beveled sealing washer or sleeve 11.

All the sealing and spring forming washers 12, 13, 14, 15 and 16, are shown as loosely disposed within the annular cavity 6 and about the central screw stud 7 so as to be free for any required self-adjusting side motion in respect to both the body of the crown and the central tubular screw stud.

The sealing and spring forming washers may be made of beryllium copper alloy and the parts are so proportioned that they will be placed under tension as the beveled sealing sleeve or ring 11 meets the case and the crown is screwed fully in place on the same. This tension is preferably such as to maintain an effective seal from the back of the crown to the case during both setting and winding positions of the crown.

To maintain the parts in the assembled relation when the crown is removed from the stem, the inner end of the screw stud 7 may be flanged as indicated at 19 to act as a retainer engageable by the inner end of the sealing member 11. It is contemplated, however, that the retainer

flange instead of being formed on the end of the screw stud, may be formed on the crown about the outer edge of the annular cavity 6, in position to be engaged by the outer periphery of the sealing member.

Fig. 2 illustrates an embodiment of the invention wherein the spring and outer sealing member are all in one instead of in several pieces.

This spring sealing member is shown as a flexible, elastic, rolled metal bellows 20 loose in the crown cavity and about the screw stud and having more or less flat flanges 21, 22, at its outer and inner ends in laterally slidable sealing engagement with the back wall 17 of the crown and the back face 18 of the beveled inner case engaging sealing member 11.

This construction also allows for all self-adjusting movements required to maintain fully sealed relations between the crown and the case.

Both constructions are relatively simple, the parts are few and can be readily assembled, the cost of such constructions is reasonable and a fully dust-tight relation between crown and case is maintained at all times regardless of imperfections as to alignment and angularity, variations in the size, etc.

Fig. 3 shows how the sealing washer may be retained in the crown by a flange 23 turned inward at the outer periphery of the annular cavity in position to be engaged by a narrow flange 24 on the rim of the sealing washer.

What is claimed is:

A dust-tight watch crown for a watch case having a beveled seat about the stem and comprising a crown body having a deep annular cavity about a central internally screw threaded stud for engagement on the stem, a sealing washer loose in the annular cavity and loose about the tubular stud and having a beveled inner face for sealing engagement with the beveled seat in the case and an expansion spring in the annular cavity back of said sealing washer and extending continuously as a flexible spring sealing wall from the back of the cavity to the back of said sealing washer, said seal forming spring being composed of dished spring washers in back-to-back relation in pairs and with the pairs separated by a substantially flat washer.

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