~~Impact-proof~~Escapement for a timepiece, with impact protection ~~escapement~~

The present invention relates to an anchor escapement for a timepiece, such as a Swiss lever escapement.

Anchor escapements generally comprise fixed limitation members in the form of walls called "solid bankings" machined in the bottom plate or in a bridge, or in the form of pins fixed to the bottom plate. These fixed limitation members serve as abutments for the anchor in order to limit the amplitude of its oscillations and define two lock positions where the anchor is in abutment against a respective one of these fixed limitation members, while a tooth of the escapement wheel is itself in abutment against the locking plane of the entry or exit pallet of the anchor. These fixed limitation members also act to protect the escapement against impacts in that they prevent the anchor from moving beyond its lock positions when the watch is subjected to impacts and thus prevent the pallets of the anchor from being able to strike the escapement wheel.

However, there are anchor escapements which do not have such fixed limitation members. In this case it is a particular arrangement or shape of the toothing of the escapement wheel and/or of the pallets which fulfils the function of limiting oscillations of the anchor during normal operation of the escapement, i.e. which defines the lock positions of the anchor. Examples of such escapements are described in the documents CH 101651, CH 569997, CH 343898, DE 1162290, GB 682566 and US 3146581. With the exception of that described in document CH 569997, these escapements all have the disadvantage that, when the watch is subjected to impacts, the anchor can move beyond its lock positions until the impulse beak of one of the pallets strikes the escapement wheel. By way of illustration, Figure 1 shows the position of an anchor escapement without fixed limitation members after an impact which has displaced the anchor in the direction indicated by the arrow F1, while the anchor was in its lock position where its entry pallet was blocking the escapement wheel. It can be seen that the impulse beak of the entry pallet is in contact with the rim of the escapement wheel. In a similar manner, upon an impact having the effect of displacing the anchor in the opposite direction (Figure 2, arrow F2), the impulse beak of the exit pallet comes into contact with the rim of the escapement wheel.

13. Escapement as claimed in any one of claims 1 to 12, characterised in that it comprises a member (30) for transmission between the anchor and a balance staff, in that this member (30) comprises a part (29) acting as an impulse pin (15), in that the said part (29) comprises convex active surfaces (33) and an inactive surface (34) connecting the active surfaces (33) to each other, and in that the inactive surface (34) is convex with a radius of curvature which is greater than that of the active surfaces (33), so as to soften the transition (35) between the inactive surface (34) and each of the active surfaces (34).

14. Escapement as claimed in claim 13, characterised in that the said member (30) is a single-piece member comprising an opening (31) for its mounting on the balance staff and a protrusion (29) extending radially and constituting the said part (29) acting as an impulse pin (15).

15. Escapement as claimed in any one of claims 1 to 14, characterised in that it consists of a Swiss lever escapement.

~~16. Escapement anchor for a timepiece comprising a fork having a fork notch (28) and horns (26), characterised in that the inner face (25) of each horn (26) is rounded so as to soften the transition between this inner face (25) and the corresponding inner face (27) of the fork notch (28).~~

~~17. Member (30) for transmission between a timepiece anchor and a timepiece balance staff, comprising a part (29) acting as an impulse pin (15), the said part (29) comprising convex active surfaces (33) and an inactive surface (34) connecting the active surfaces (33) to each other, characterised in that the inactive surface (34) is convex with a radius of curvature which is greater than that of the active surfaces (33) so as to soften the transition (35) between the inactive surface (34) and each of the active surfaces (34).~~

~~18~~16. Timepiece comprising an escapement as claimed in any one of claims 1 to 15~~, an anchor as claimed in claim 16 or a transmission member as claimed in claim 17~~.