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ESCAPEMENT LEVER FOR WATCHES, TIMEPIECES AND THE LIKE

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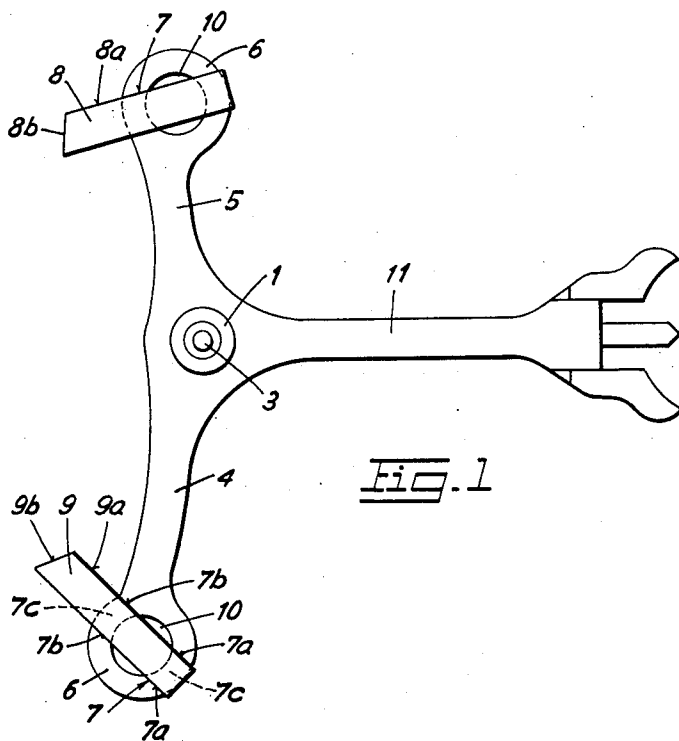


Fig. 1

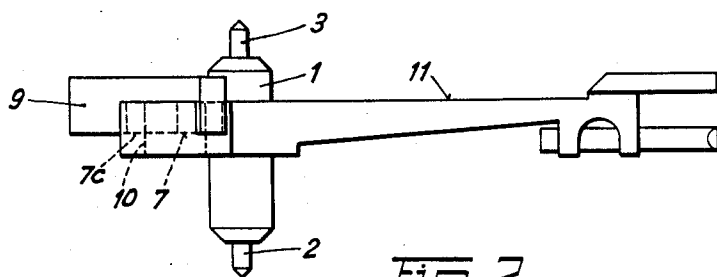


Fig. 2

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ESCAPEMENT LEVER FOR WATCHES, TIME-PIECES AND THE LIKE

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6 Claims. (Cl. 58-121)

This invention relates to escapement levers for watches, timepieces and the like and in particular to the holding arrangement of the pallets of these levers.

The escapement levers known in the art and used in the best watches are provided at the ends of their arms with heavy portions serving as holding frame for the pallet jewels. For this purpose these end portions of the lever arms are slit so as to form a lodging for the pallet jewels. The thickness of the lever arm ends is substantially equal to that of the pallet jewels. Although the end portions of the lever arms are provided with slots they still constitute a relatively bulky frame contributing to give the whole lever a great moment of inertia. These fixing means used in the best watches to secure the pallets to the lever have moreover the drawback that they only grip the pallets along two opposite faces. The pallets may consequently happen to get inclined with respect to the lever for instance when the shellac or other glue securing the pallets to the lever is heated to enable setting said pallets with respect to the lever.

Since the lever causes variations in the running rate of the watch to an extent depending on the moment of inertia of the lever, it appears that the pin pallet escapements used in the commoner watches are better in this respect than the jewelled levers considered, because the lever of the pin pallet escapement is not as heavy as said jewelled lever, since it consists of a very thin plate on which the pins are standing upright. It has therefore already been proposed to set pallet jewels upright on to the lever. The levers obtained in that manner have however the drawback that their pin pallets cannot be shifted with respect to the lever to adjust the pallet dipping and the run of the escapement with precision. Moreover the impulse and locking faces of pallets fixed upright on to a lever plate cannot be observed through the usual openings provided in the base plate of the movement in checking the lever working.

To hold the pallet jewels satisfactorily it has also been proposed to locate these jewels in a transverse slot provided in the upper face of the lever arms. The solution has however the drawback that the lever obtained is still heavier than the usual levers with slit arms.

It is therefore an object of this invention to provide a holding arrangement for the lever pallets which enables to make the lever arm ends substantially lighter than with the usual levers known in the art, while ensuring the same conditions as regards checking the operation of the lever and while keeping the same general arrangement of the watch as with said usual levers.

Still further objects of the invention will become apparent in the course of the following description.

One embodiment of the escapement lever according to the invention is represented by way of example in the drawings annexed to this specification.

In the drawings:

FIG. 1 is a plan view of this embodiment and

FIG. 2 an elevational view thereof.

With reference to the drawings the lever represented has the general form of a common three-armed lever as used with straight line escapements. It is rigidly fixed on to a usual staff 1 provided with pivots 2 and 3 at both its ends for journaling the lever in pivot bearings (not

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shown) carried by the base plate and by the pallet cock, respectively, of a watch movement. The two pallet holding arms 4 and 5 of this lever are formed with enlarged substantially circular portions 6 at their ends. Transverse slots 7 are provided in the upper face of parts 6 so as to extend in directions corresponding to those of the usual slits provided across the lever arm ends of the known levers. These slots 7 serve as lodging for the entry or receiving pallet jewel 8 and for the exit or discharging pallet jewel 9. The form of these jewels and in particular the directions of their locking faces 8a, 9a and of their impulse faces 8b, 9b are the same as with usual levers. The jewels 8, 9 are of course also secured to the lever within slots 7 by means of glue as for instance shellac, so that they can be shifted lengthwise within slots 7 to adjust the operation of the escapement with precision.

Instead of being held only along two opposite faces as with usual escapement levers, the pallets 8 and 9 are held along three faces by the two side faces and the bottom face of slots 7.

Cylindrical bores 10 are provided across the enlarged portion 6 of the lever in a direction parallel to the rocking axis of the lever. The diameter of these bores is somewhat greater than the widths of pallets 8 and 9, so that each side face and the bottom face of slots 7 is divided into two surface portions. Each pallet is thus held transversely by means of two pairs of surface portions 7a, 7b and it lies on two bottom portions 7c for its holding at the proper level. Practically, each of the pallets 8 and 9 is held in two points, one of which is situated at the rear portion of the pallet and the other one is situated in the mid portion of the pallet. It will now be observed that holding the pallet by gripping it at two different points which are relatively far from one another has of course the advantage to ensure a precise fixing of the pallets to the lever.

The cylindrical bores 10 have furthermore the advantage to make the lever arms 4, 5, substantially lighter than those of the usual levers thus correspondingly reducing the moment of inertia of the whole lever. The bores 10 have still the advantage that they greatly facilitate the introduction of glue on to the surface portions of the pallets and the lever arms in contact with one another. If the glue used is for instance shellac, it can merely be dropped into bores 10 from the lower face of the lever and a thin film of shellac will be formed on every surface portion of the pallet engaged by a corresponding surface portion of the lever arms.

FIG. 2 shows that the pallets extend above the upper lever face. With respect to staff 1 the upper lever face 11 is thus farther away from pivot 3 than with usual levers, provided that the pallets be in both cases located at the same level. Now, a substantial gap between the upper lever face and the lower face of the lever cock (not shown) carrying the bearing of pivot 3 permits lubricating this bearing without any danger of forming an oil film by capillary action between said lower cock face and face 11 of the lever. Such an oil film often happens indeed to be formed with the usual levers when oiling the upper pivot thereof, because the usual levers are closely adjacent to their cocks. An oil film formed between the lever and its cock has of course the drawback to handicap the rocking motions of the lever thus causing the watch to stop. Most of the watch manufacturers prefer therefore leaving the upper pivot of the lever dry.

While one embodiment of the invention has been described in detail with reference to the drawings, various changes in the shape, sizes and arrangement of parts will appear obvious to those skilled in the art.

I claim:

1. In an escapement lever comprising an arm and a

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pallet on said arm, a pallet holding arrangement comprising a pair of pallet holding portions on said lever arm, said holding portion being spaced from one another in a direction parallel to said pallet, one of said holding portions gripping a rear portion of said pallet and the other one gripping a mid-portion of said pallet.

2. In an escapement lever comprising an arm and a pallet on said arm, a pallet holding arrangement comprising a first portion of said arm provided with pallet holding means to hold a rear portion of said pallet, and a second portion of said arm provided with pallet holding means remote from said pallet holding means of said first arm portion to hold a mid-portion of said pallet.

3. In an escapement lever comprising an arm and a pallet on said arm, a pallet holding arrangement comprising a first portion of said arm provided with a slot having two side faces each engaging a portion of opposed side faces of said pallet and a bottom face engaging a portion of a face of said pallet situated between said opposed side faces, and a second portion of said arm provided with a slot aligned with the slot of said first arm portion and having two side faces each engaging a portion of said opposed side faces of said pallet and a bottom face engaging a portion of said face of the pallet situated between said opposed side faces, said face portions of said pallet engaged by the slot faces of said first arm portion and said face portions of said pallet engaged by the slot faces of said second arm portion being longitudinally spaced apart along said pallet.

4. In an escapement lever comprising an arm and a pallet secure on said arm in a transverse direction with

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respect thereto, a pallet holding arrangement comprising an opening said arm forming a pallet supporting rear arm portion and a pallet supporting fore arm portion, aligned slots each provided in one of said arm portions, each of said slots being formed with two opposite side faces and a bottom face extending therebetween, said slot faces of said rear arm portion surrounding and firmly engaging a rear pallet portion and said slot faces of said forearm portion surrounding and firmly engaging a middle pallet portion.

5. An escapement lever for watches, timepieces and the like, comprising, in combination, two flat arms each having an upper and a lower face, each of said arms having a free end and an enlarged portion formed at said free end, a transverse slot provided in one of said faces of each of said enlarged portions, each slot having two opposite side faces and a bottom face, a bore perpendicular to said lower and upper faces of said arms provided across each of said enlarged portions with a diameter greater than the distance between the opposite side faces of said slots, each of said bores dividing each of said side faces and said bottom faces into two pallet engaging surface portions.

6. The escapement lever of claim 5, said slots being provided in the upper faces of said arms and having a depth smaller than the pallet thickness.

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