

PATENT SPECIFICATION

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DRAWINGS ATTACHED

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(54) TIMEPIECE MOVEMENT

(71) We, KABUSHIKI KAISHA SUWA SHIKOSHU, a corporation of Japan of 3-4, 4-chome, Ginza, Chuo-ku, Tokyo, Japan, do hereby declare the invention, for which we pray that a patent may be granted to us, and the method by which it is to be performed, to be particularly described in and by the following statement:—

This invention concerns a timepiece movement, e.g. for a wristwatch.

According to the present invention there is provided a timepiece movement comprising first and second sheet members which are spaced apart and secured together by pillar members, a third sheet member which is disposed between and spaced from the first and second sheet members and which is supported by the pillar members, the third sheet member having a portion which extends outwardly of the plane thereof and which has a hole therein in which a rotary movement part is mounted.

The said outwardly extending portion has preferably been pressed out of the third sheet member. The movement part which is mounted on the said hole is preferably a stem of the movement.

The movement may comprise a crown wheel, the crown wheel being mounted on a pin which is secured to the third sheet member and to one of the first and second sheet members.

Moreover, the third sheet member may support a click.

The movement may also comprise a gear wheel which is mounted on a shaft which is rotatably mounted in the first and second sheet members, the shaft extending freely through a hole in the third sheet member.

The first sheet member may be a plate and a second sheet member a bridge carried by the plate, the bridge being thinner than the plate.

The invention also comprises a timepiece provided with a movement as set forth

[Price 25p]

above.

The invention is illustrated, merely by way of example, in the accompanying drawings, in which:—

Figure 1 is a cross-sectional view of a known timepiece movement,

Figure 2 is a plan view of one embodiment of a timepiece movement in accordance with the present invention, and

Figure 3 is a cross-sectional view taken on the line 3-3 of Figure 2.

A timepiece movement is known comprising two bridge members, or a plate and a bridge member, which are spaced apart by pillar members. Such a construction is used in a number of different timepiece movements for the purpose of simplifying them, and it has recently been employed in electrically operated timepiece movements. As the bridge members are thin, the material costs can be reduced, while manufacture may be carried out efficiently because of the small amount of metal cutting which is required. Moreover, any unbalance resulting from internal stresses is reduced, while curvature in the parts and changes in the accuracy of the movement as the movement becomes older are small. However, such a construction has many disadvantages. Thus it is impossible to make a hole in the side of one of the bridge members in order to guide a winding stem of the movement. Moreover, some parts of the movement, which would normally be arranged within the thickness of the plate, can only be arranged with great difficulty if the plate is thin. Any inaccuracy in the distances between the axes of the pillar members, moreover, or in the curvature of their walls, can make it impossible to assemble the bridge member accurately to the plate.

In order to attempt to overcome these defects, it is known to provide a watch movement as shown in Figure 1, in which

Price 75p

a relatively thick sheet metal plate 11 and a relatively thin sheet metal bridge member 12, are spaced apart by means of a stem guide block 13. The stem guide block 13 is secured to the plate 11 by means of pillar members 15, 16, the bridge 12 being secured to the plate 11 by means not shown. The stem guide block 13 is provided with a hole 17 opening to one side thereof, and mounted in the hole 17 is one end of a winding stem 18 of the movement.

The construction shown in Figure 1, however, has the disadvantage that the stem guide block 13 has to be made thick, and is therefore expensive. Moreover, a hole in a thick plate cannot be formed efficiently. Furthermore the number of parts in the movement of Figure 1 are increased by the need to provide the pillar members 15, 16, while the construction in Figure 1 restricts the space in which parts of the movement may be mounted and makes it difficult to assemble.

In the timepiece movement according to the present invention shown in Figures 2 and 3, however, a sheet metal plate member 20 and a relatively thinner sheet metal bridge member 21 which is disposed parallel thereto, and spaced therefrom, are secured together by two or more pillar members 22, 23. A sheet metal member 24, which is parallel to the plate 20 and bridge member 21 and which is spaced from them, is maintained in position therebetween by being mounted on the pillar members 22, 23.

The sheet member 24 has a portion 25 which has been pressed out of it so as to extend substantially at right angles to the plane thereof. The outwardly extending portion 25 has a hole 26 therein in which an end of a winding stem 27 of the movement is mounted, whereby the sheet member 24 supports the stem 27.

The rigidity of the sheet member 24 is increased by the pressing out of the outwardly extending portion 25, and the sheet member 24 may therefore be made thin so that the hole 26 can be pressed out thereof.

It will be noted that the pillars 22, 23, in the construction of Figures 2 and 3, not only support the sheet member 24 but also constitute the means by which the bridge member 21 is supported from and carried by the plate 20. Thus the construction of Figures 2 and 3 reduces the number of parts required.

The sheet member 24 is provided with apertures 30, 31 for receiving the respective mid-portions of the pillar members 22, 23, and thus serves to effect accurate positioning of the pillar members so that the correct centre distance between the pillar members 22, 23 can be readily maintained. The advantage of this is even greater if more than two pillar members 22, 23 are em-

ployed. Moreover, since the sheet member 24 may be made thin, it can easily be pressed to a desired shape.

The movement of Figures 2 and 3 includes a crown wheel 32, a click 33 and a gear train including a wheel 34. The crown wheel 32 is mounted on a pin 35 which is mounted both in the sheet member 24 and the bridge 21. The click 33 is mounted on a pin 36 which is also mounted in the sheet member 24 and in a bearing in the bridge member 21. Thus the sheet member 24 also serves to support both the crown wheel 32 and the click 33.

The gear wheel 34 is mounted on a shaft 37 which is rotatably mounted in bearings in the plate 20 and in the bridge member 21. The shaft 37 extends freely through a hole 38 in the sheet member 24. Thus the construction is such that the mounting of the shaft 37 in the hole 38 ensures that the shaft 37 is supported during the assembly of the movement so that tilting of the gear wheel 34 during said assembly is avoided. The construction also enables one to ensure that the crown wheel 32 and the click 33 can be placed at the most suitable position in the movement relative to the main spring (not shown). The thickness of the timepiece may therefore be kept small, while special parts to hold the crown wheel 32 and click 33 are not required.

It is not essential to make the sheet member 24 thin, although the invention is of greatest advantage where it is made thin.

A movement as shown in Figures 2 and 3 enables the cost of materials to be reduced for a thin timepiece movement, and improves manufacturing efficiency due to the small amount of material which needs to be removed. Curvature and warping of the parts with the passage of time is, moreover, reduced, while pressing of the hole 26 is more efficient than the conventional cutting process. The number of parts are decreased as the pillar members 22, 23 serve to interconnect the sheet member 24, the plate 20 and the bridge member 21.

WHAT WE CLAIM IS:—

1. A timepiece movement comprising first and second sheet members which are spaced apart and secured together by pillar members, a third sheet member which is disposed between and spaced from the first and second sheet members and which is supported by the pillar members, the third sheet member having a portion which extends outwardly of the plane thereof and which has a hole therein in which a rotary movement part is mounted.

2. A timepiece movement as claimed in claim 1 in which the said outwardly extending portion has been pressed out of the third sheet member.

a relatively thick sheet metal plate 11 and a relatively thin sheet metal bridge member 12, are spaced apart by means of a stem guide block 13. The stem guide block 13 is secured to the plate 11 by means of pillar members 15, 16, the bridge 12 being secured to the plate 11 by means not shown. The stem guide block 13 is provided with a hole 17 opening to one side thereof, and mounted in the hole 17 is one end of a winding stem 18 of the movement.

The construction shown in Figure 1, however, has the disadvantage that the stem guide block 13 has to be made thick, and is therefore expensive. Moreover, a hole in a thick plate cannot be formed efficiently. Furthermore the number of parts in the movement of Figure 1 are increased by the need to provide the pillar members 15, 16, while the construction in Figure 1 restricts the space in which parts of the movement may be mounted and makes it difficult to assemble.

In the timepiece movement according to the present invention shown in Figures 2 and 3, however, a sheet metal plate member 20 and a relatively thinner sheet metal bridge member 21 which is disposed parallel thereto, and spaced therefrom, are secured together by two or more pillar members 22, 23. A sheet metal member 24, which is parallel to the plate 20 and bridge member 21 and which is spaced from them, is maintained in position therebetween by being mounted on the pillar members 22, 23.

The sheet member 24 has a portion 25 which has been pressed out of it so as to extend substantially at right angles to the plane thereof. The outwardly extending portion 25 has a hole 26 therein in which an end of a winding stem 27 of the movement is mounted, whereby the sheet member 24 supports the stem 27.

The rigidity of the sheet member 24 is increased by the pressing out of the outwardly extending portion 25, and the sheet member 24 may therefore be made thin so that the hole 26 can be pressed out thereof.

It will be noted that the pillars 22, 23, in the construction of Figures 2 and 3, not only support the sheet member 24 but also constitute the means by which the bridge member 21 is supported from and carried by the plate 20. Thus the construction of Figures 2 and 3 reduces the number of parts required.

The sheet member 24 is provided with apertures 30, 31 for receiving the respective mid-portions of the pillar members 22, 23, and thus serves to effect accurate positioning of the pillar members so that the correct centre distance between the pillar members 22, 23 can be readily maintained. The advantage of this is even greater if more than two pillar members 22, 23 are employed.

Moreover, since the sheet member 24 may be made thin, it can easily be pressed to a desired shape.

The movement of Figures 2 and 3 includes a crown wheel 32, a click 33 and a gear train including a wheel 34. The crown wheel 32 is mounted on a pin 35 which is mounted both in the sheet member 24 and the bridge 21. The click 33 is mounted on a pin 36 which is also mounted in the sheet member 24 and in a bearing in the bridge member 21. Thus the sheet member 24 also serves to support both the crown wheel 32 and the click 33.

The gear wheel 34 is mounted on a shaft 37 which is rotatably mounted in bearings in the plate 20 and in the bridge member 21. The shaft 37 extends freely through a hole 38 in the sheet member 24. Thus the construction is such that the mounting of the shaft 37 in the hole 38 ensures that the shaft 37 is supported during the assembly of the movement so that tilting of the gear wheel 34 during said assembly is avoided. The construction also enables one to ensure that the crown wheel 32 and the click 33 can be placed at the most suitable position in the movement relative to the main spring (not shown). The thickness of the timepiece may therefore be kept small, while special parts to hold the crown wheel 32 and click 33 are not required.

It is not essential to make the sheet member 24 thin, although the invention is of greatest advantage where it is made thin.

A movement as shown in Figures 2 and 3 enables the cost of materials to be reduced for a thin timepiece movement, and improves manufacturing efficiency due to the small amount of material which needs to be removed. Curvature and warping of the parts with the passage of time is, moreover, reduced, while pressing of the hole 26 is more efficient than the conventional cutting process. The number of parts are decreased as the pillar members 22, 23 serve to interconnect the sheet member 24, the plate 20 and the bridge member 21.

WHAT WE CLAIM IS:—

1. A timepiece movement comprising first and second sheet members which are spaced apart and secured together by pillar members, a third sheet member which is disposed between and spaced from the first and second sheet members and which is supported by the pillar members, the third sheet member having a portion which extends outwardly of the plane thereof and which has a hole therein in which a rotary movement part is mounted.

2. A timepiece movement as claimed in claim 1 in which the said outwardly extending portion has been pressed out of the third sheet member.



3. A timepiece movement as claimed in claim 1 or 2 in which the movement part which is mounted in the said hole is a stem of the movement.
- 5 4. A timepiece movement as claimed in any preceding claim in which the movement comprises a crown wheel, the crown wheel being mounted on a pin which is secured to the third sheet member and to one of 10 the first and second sheet members.
5. A timepiece movement as claimed in any preceding claim in which the third sheet member supports a click.
- 15 6. A timepiece movement as claimed in any preceding claim in which the movement comprises a gear wheel which is mounted on a shaft which is rotatably mounted in the first and second sheet members, the shaft extending freely through a hole in the third sheet member. 20
7. A timepiece movement as claimed in any preceding claim in which the first sheet member is a plate and the second sheet member is a bridge carried by the plate, the bridge being thinner than the plate. 25
8. A timepiece movement substantially as hereinbefore described with reference to and as shown in Figures 2 and 3 of the accompanying drawings.
9. A timepiece provided with a move- 30 ment as claimed in any preceding claim.
- J. MILLER & CO.,
Agents for the Applicants,
Chartered Patent Agents,
262 High Holborn,
London, WC1V 7EF.

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