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"CLOCK"

The present invention relates to a clock such as a hanging clock, or the like, and, although it is not so restricted, the invention particularly relates to a thin clock.

5 A clock is known which is provided with a timepiece movement support plate which is also used as a back frame, a movement, housed in a capsule, being fixedly attached to a back surface of the movement support plate. A dial is disposed in front of the movement support plate, a transparent front cover is fixedly
10 attached to the movement support plate in front of the dial, and hands are disposed between the front cover and the dial and are driven by the timepiece movement. A time-setting shaft for correcting the time is disposed
15 on the back side of the movement support plate.

Recently, there has been a requirement for a light, thin and small clock, so that it has been an extremely important technical problem, to make the clock thin. Under such circumstances, the distance between
20 the dial and the front cover is made extremely small, and, further, the front cover, the dial, the movement support plate, and even the hands themselves have been formed extremely thin insofar as the strength of the clock would permit it.

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As a result, the movement support plate and the front cover can easily be deformed due to temperature, the application of pressure in turning the hands, and so on, so as to cause the front cover to touch the hands, especially the minute hand, so that the minute hand comes off the minute hand shaft, the front cover is rubbed by the minute hand, and is damaged thereby, or, in the worst case, the clock is stopped.

The object of the present invention is therefore to provide a clock in which the space between the front cover and the dial can be kept substantially constant even if the movement support plate or the front cover is deformed.

According therefore to the present invention, there is provided a clock comprising a timepiece movement supported by a movement support plate; a dial having time indicating members which are mounted on and are fixedly attached to a front face of the dial, the dial being disposed in front of the movement support plate; a transparent front cover disposed in front of the dial with a space therebetween; clock hands disposed in the space and driven by the timepiece movement to move relative to the time indicating members so as to indicate the time; and the time indicating members having a height substantially corresponding to that of the space between the dial and the front cover so as to act as

spacer means for maintaining the space substantially constant, the time indicating members having leg portions which pass through the dial, the ends of the leg portions remote from the dial abutting or being adapted to be brought into abutment with the movement support plate.

The movement is preferably housed in a capsule carried by the movement support plate.

Each leg portion may have an axial split groove therein.

If desired, the dial may be bonded to the movement support plate.

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

Figure 1 is a front view of a clock according to the present invention,

Figure 2 is an enlarged cross-sectional view of the clock of Figure 1,

Figure 3 is an enlarged cross-sectional view of a main part of the clock of Figures 1 and 2, and

Figure 4 is an enlarged cross-sectional view of a main part of another embodiment of a clock according to the present invention.

Terms such as "top" and "bottom", as used herein, are to be understood to refer to directions as seen in the accompanying drawings.

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Referring first to Figures 1 and 2, a thin clock according to the present invention is constituted by a movement support plate 1 which is also used as a back frame, a dial 2 which is disposed in front of the movement support plate 1 with a space 1a therebetween, a transparent front cover 3 disposed in front of the dial 2, with a space 3a therebetween, and a movement capsule or housing 4 which is fixed in a central portion of the movement support plate 1. A minute hand 5 and an hour hand 6 are driven by a known timepiece movement (not shown) which is provided in the housing 4, the hands 5, 6 being disposed in the space 3a between the dial 2 and the front cover 3. Decorative buttons 7, which are used as time indicating members, and which for this purpose are disposed at the 3 o'clock, 6 o'clock, 9 o'clock, and 12 o'clock positions are fixedly attached to and extend outwardly from the front surface of the front cover 3. Screws 8, which are inserted from the back side of the movement support plate 1 are screwed into the back surfaces of the respective decorative buttons 7 so that the front cover 3 and the movement support plate 1 are connected to each other with the dial 2 interposed therebetween.

As shown in Figure 3, through holes 2a are bored in the dial 2 so as to receive respective leg portions 9a of spacers or time indicating members 9. Each of the spacers 9 has a shoulder portion which has been inserted into the

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 respective through hole 2a from the front surface side of
 the dial 2. The respective upper ends of the spacers 9
 abut against or are closely adjacent to the front cover 3
 and the respective leg portions 9a of the spacers 9 abut against
 or are disposed closely adjacent to the movement support plate
 1. An axial split groove 9b is formed in the leg portion 9a
 of each spacer 9 to provide elastic force to open the leg
 portion 9a outwards and thus fix the spacers 9 to the dial
 2. The spacers 9, which are visible through the transparent
 front cover 3, are provided at positions in which they do
 not prevent the hands 5 and 6 from turning and are disposed
 at time indicating positions such as the 1 o'clock, 2 o'clock,
 4 o'clock, 5 o'clock, 7 o'clock, 8 o'clock, 10 o'clock and
 11 o'clock positions. The spacers 9 are thus used also as
 time indicating members. Thus each of the hour positions is
 indicated either by a decorative button 7 or by a spacer 9.

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 Consequently, even if the front cover 3 changes
 shape due to a temperature change or to the application of
 pressure while turning the hands, the space between the
 front cover 3 and the dial 2, and the space between the
 dial 2 and the movement support plate 1 is kept substantially
 constant, so that the shape of the dial 2 is never changed.

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 Alternatively, the same effect as that described above
 can be obtained even if the respective front end surfaces
 of the spacers 9 and the respective back end surfaces
 of the leg portions 9a are arranged to be respectively
 adjacent to the front cover 3 and to the movement support
 plate 1 with slight clearances therebetween respectively.



Figure 4 shows another embodiment in which a dial 12 is bonded onto a front surface of a movement support plate 11 so as to prevent the shape of the dial 12 from being changed. That is, respective top ends of spacers 19 which are mounted in the dial 12 abut against a front cover 13 and respective back ends of the spacers 19 are disposed closely adjacent to but can abut against respective bottom surfaces of corresponding hollow portions 11a in the movement support plate 11.

C L A I M S

1. A clock comprising a timepiece movement supported by a movement support plate; a dial having time indicating members which are mounted on and are fixedly attached to a front face of the dial, the dial being disposed in front of the movement support plate; a transparent front cover disposed in front of the dial with a space therebetween; clock hands disposed in the space and driven by the timepiece movement to move relative to the time indicating members so as to indicate the time; and the time indicating members having a height substantially corresponding to that of the space between the dial and the front cover so as to act as spacer means for maintaining the space substantially constant, the time indicating members having leg portions which pass through the dial, the ends of the leg portions remote from the dial abutting or being adapted to be brought into abutment with the movement support plate.
2. A clock as claimed in claim 1 in which the movement is housed in a capsule carried by the movement support plate.
3. A clock as claimed in claim 1 or 2 in which each leg portion has an axial split groove therein.
4. A clock as claimed in any preceding claim in which the dial is bonded to the movement support plate.



5. A clock as claimed in claim 1 and substantially as hereinbefore described with reference to and as shown in Figures 1 and 2 or as in Figures 3 or Figure 4 of the accompanying drawings.
