United States Patent [19]

Nava et al.

[11] **3,735,580**

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[54] **CLOCK**

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[51] **Int. Cl.** **G04b 37/00**

[58] **Field of Search** 58/53–55

[56] **References Cited**

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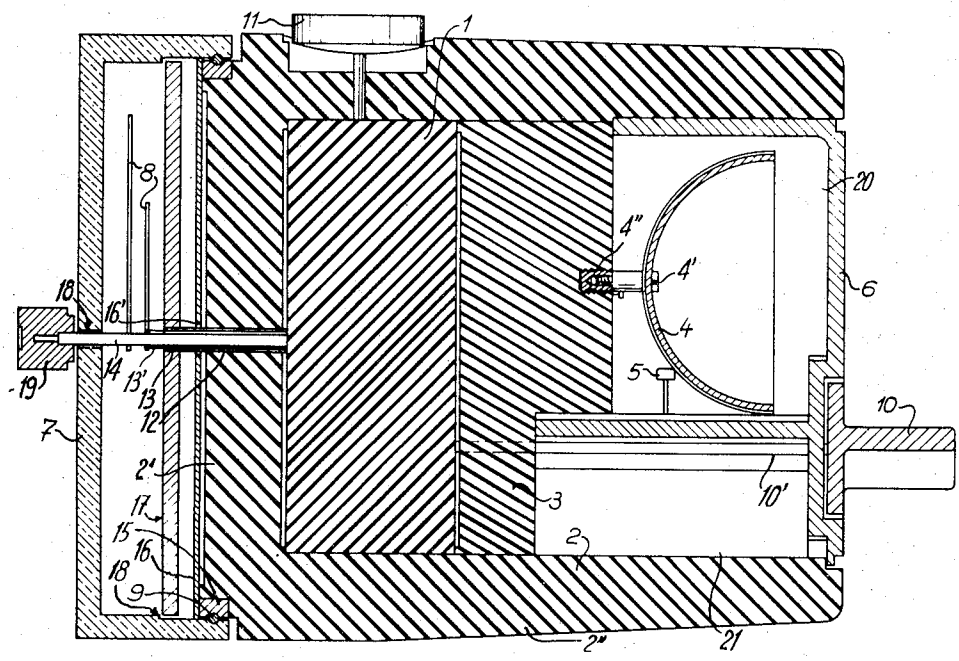
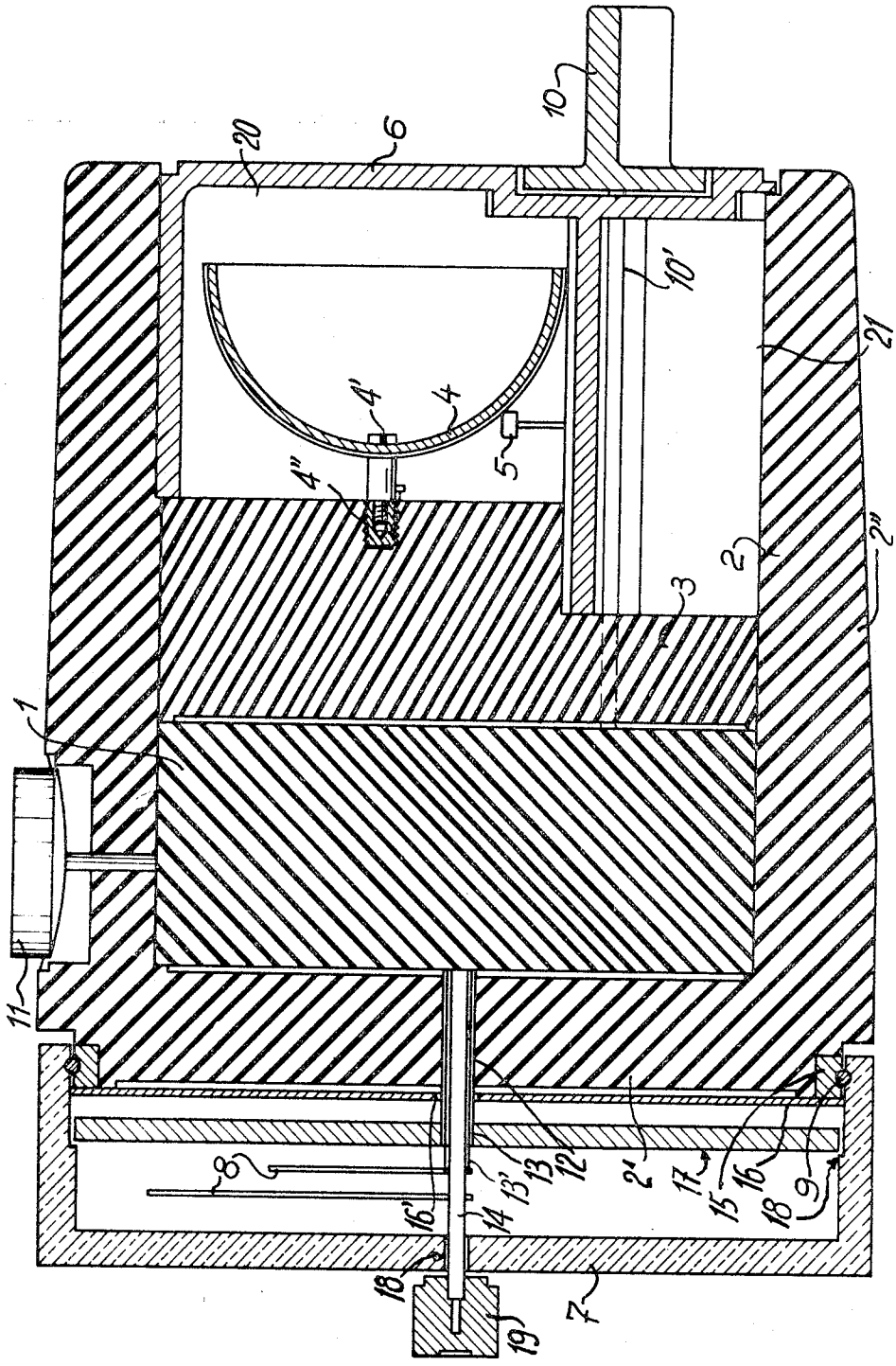
[57] **ABSTRACT**

A clock has a clockwork movement enclosed in a soundproof case of expanded plastic material having a substantially non-porous smooth outer surface and a sponge-like inner cellular structure. The dial and hands and, possibly, a sonorous alarm are located outside the case.

4 Claims, 1 Drawing Figure




10
20
6
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21
4'
4
4"
5
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18
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18'
19
7

CLOCK

BACKGROUND OF THE INVENTION

This invention relates to clocks, and is particularly concerned with soundproof clocks in which the noise of a mechanical clockwork movement is rendered inaudible.

It has already been proposed in U.S. Pat. No. 1,345,766 to provide, in a clock, in combination with a main frame which encloses and carries the clockwork movement, a substantially soundproof sub-frame carried thereby, this sub-frame enclosing and carrying the escapement mechanism. The use of such a sub-frame, whilst effective in reducing the noise of the escapement mechanism, considerably complicates manufacture of the overall clockwork movement, and adds to the total cost of the clock, which must include both a main frame and a subsidiary frame.

Other proposals have been directed to providing a sound-damping annular packing around the edge of the clockwork movement; providing a main supporting plate of the clockwork movement in a sound-damping material; and mounting clockwork movement in a casing by the intermediary of sound-damping blocks. However, these proposals, whilst adding to the cost, do not fully sound-proof the clock.

SUMMARY OF THE INVENTION

An object of the invention is to provide a clock of simple and economical construction and with which the sound of the clockwork movement is rendered inaudible.

The invention therefore proposes a clock comprising a substantially soundproof case of expanded plastic material enclosing a clockwork movement, said material having an inner cellular structure. An elongate cylindrical aperture passing through said case and through a dial fixed outside the case receives a driving shaft and pipe assembly, and time indicating members are drivably mounted on a part of said assembly protruding beyond the dial.

BRIEF DESCRIPTION OF THE DRAWINGS

The single FIGURE of the accompanying drawings is a schematic cross-section through an embodiment of an alarm clock according to the invention, given by way of example.

DESCRIPTION OF THE PREFERRED EMBODIMENT

The alarm clock shown comprises a clockwork movement **1** enclosed in a soundproof case including a main body portion **2** and a rear wall **3.** The two parts of the case are made by moulding an expanded plastic material with a substantially non-porous smooth outer surface and an elastic inner cellular structure formed by sponge-like pores which have good sound absorbing properties. Suitable materials are natural or synthetic rubber, polyvinyl chloride and polyurethane, although the latter two materials are to be preferred. The outer surfaces of both parts of the case, or simply the visible outer surface of the portion **2,** may, if required, be coated with a second material either to increase the rigidity of the case or for decorative purposes.

The main body portion **2** is formed of a circular front wall **2'** with an elongate cylindrical central aperture **12** and a substantially cylindrical sidewall **2''** extending

rearwardly from the front wall. An assembly of coaxial pipes **13, 13'** and a central shaft **14** fixed to the clockwork movement **1** protrude through the aperture **12,** the inner pipe **13'** and the shaft **14** being driven in conventional manner by the clockwork movement at a rate of one revolution per 12 hours and one revolution per hour respectively.

About the periphery of the front wall **2'** is mounted a rigid ring **15,** and a dial **16** is secured to this ring **15** so as to cover the outer face of the front wall **2'.** The dial **16** has a circular central aperture **16'** for the assembly of pipes **13, 13'** and carries, at the periphery of its outer face, conventional hour and minute divisions.

A transparent disc **17** is securely fixed to the outer pipe **13,** and carries thereon at least one reference mark, not shown. Outside this disc **17,** hour and minutes hands **8** are mounted on the pipe **13'** and the shaft **14** respectively so as to give, in cooperation with the divisions on the dial **16,** an indication of time. A transparent cover **7** is fixed by means of an O-ring **9** onto the ring **15,** this cover **7** including a shoulder **18** against which the periphery of disc **17** is rotatably mounted, and a central opening **18** for the shaft **14.** An external knurled knob **19** is secured to the outer end of shaft **14** to permit setting of the hands **8.**

The rear wall **3** fits against the clockwork movement **1** between the cylindrical inner surface of the side wall **2''**, said side wall **2''** extending rearwardly of the wall **3** to form a rear recess **20** therewith. An opaque cover **6** of sound transmitting material is fitted in said side wall **2''** to close the recess **20.** A schematically shown sonorous alarm, including a gong **4** secured to the wall **3** by means of a screw **4'** engaging in a threaded socket **4''** embedded in the wall **3,** a hammer **5** and a driving mechanism **21** for the hammer **5,** is mounted in the recess **20.** The cover **6** also carries at least one control member **10** for the alarm, said member **10** being rotatably mounted on a shaft **10'** passing through an aperture in the wall **3** and operatively connected to the clockwork movement **1.** By means of this control member **10,** the outer pipe **13** and disc **17** can be rotated to set the mark thereon to show the time at which the alarm mechanism is to be triggered. A second push-button control member **11** mounted in a recess in the wall **2''** enables the alarm mechanism to be blocked, in a conventional manner. Other control members, for example for winding the alarm mechanism, may also be included.

It can be readily seen that during operation of the described alarm clock, the case **2** absorbs practically all of the sound of the clockwork movement **1,** in particular that of the escapement mechanism. The sound of the alarm, however, is not appreciably attenuated. Moulding of the case enables the described clock to be manufactured at a relatively low cost price. The moulded case moreover has a good resistance to shocks and ensures a good protection of the clockwork movement against humidity, dust and atmospheric pollutions.

What is claimed is:

1. A clock comprising a clockwork movement, a substantially soundproof case of expanded plastic material enclosing said clockwork movement, said material having an inner cellular structure, a dial fixed outside said case, an elongate cylindrical aperture passing through said case and said dial, a coaxial pipe driving assembly driven by said clockwork movement, said assembly

passing through said aperture and protruding beyond said dial, and time indicating members drivably mounted on a part of said assembly protruding beyond said dial.

2. A clock according to claim **1**, in which said case is made in two parts, a first part including a flat front wall and at least one side wall extending rearwardly therefrom, said front wall including said aperture and said dial being fixed adjacent to the outer face of said front wall, said at least one side wall surrounding and extending rearwardly beyond said clockwork movement, and a second part forming a rear wall of the case fitting against said clockwork movement between said at least one side wall, said at least one side wall extending rearwardly beyond said rear wall to form a rear recess therewith, a sound-transmitting cover closing said rear recess, and a sonorous alarm mounted in said rear recess.

3. A clock according to claim **1**, in which said case is in expanded polyvinyl chloride having a sponge-like inner cellular structure with a substantially non-porous smooth surface coating.

4. A clock according to claim **1**, in which said case is in expanded polyurethane having a sponge-like inner cellular structure with a substantially non-porous smooth surface coating.

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