

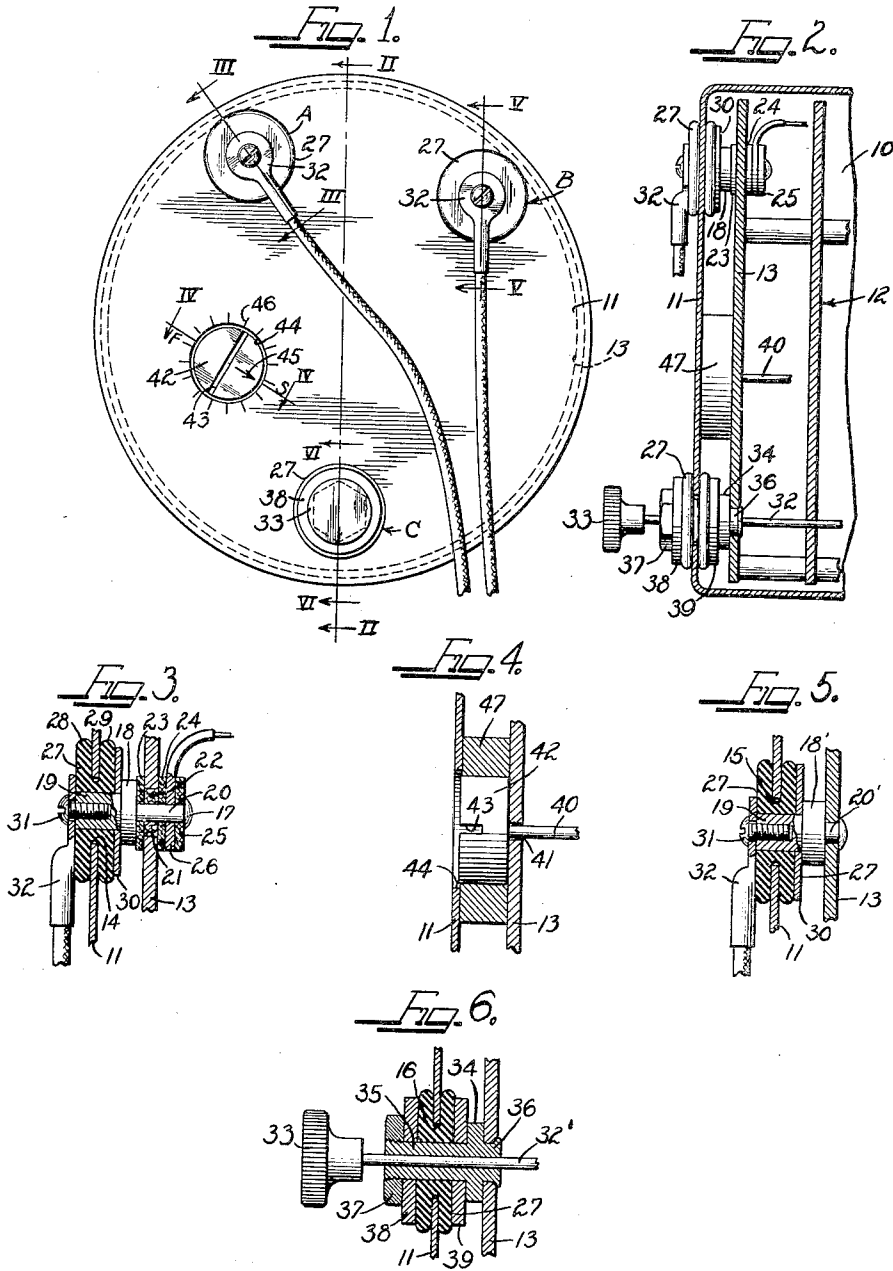
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MOUNTING FOR CLOCK MOVEMENT

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MOUNTING FOR CLOCK MOVEMENT

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The present invention relates in general to clock structures and is more particularly concerned with an improved mounting for a clock movement within a casing, which is especially desirable for use in electrically actuated clocks installed on automobiles or other vehicles in which there may be considerable vibration.

Rubber mountings have heretofore been utilized for the mounting of clock movements in casings, but the arrangements have been such that there is a possibility, when the rubber deteriorates or the securing screws become loosened, of the movement hitting the clock casing due to jarring or other vibrations set up in the vehicle when driving it over a somewhat bumpy road. As a result, noises are set up which may be very disturbing indeed to the occupants of the vehicle.

Moreover, the previously used constructions in electrically actuated clocks have been relatively expensive to manufacture. The usual practice has been to provide separate electrical terminal connections, and different means for mounting of the clock movement in its casing. In these arrangements it becomes necessary to utilize a small flexible "bus bar" for establishing a ground between the clock movement and its casing. Thus a considerable number of parts are required, which increase the cost of manufacture.

Having in mind the inherent disadvantages and objections to the arrangements heretofore utilized, the present invention contemplates an improved mounting which is so arranged that the electric terminals may be utilized as the mounting means for securing the clock movement to the casing.

A further object of the invention is to provide improved means for mounting a clock movement in a casing, wherein the movement will be resiliently supported and substantially eliminate the transmission of the operating noises of the clock mechanism to the vehicle interior, and which will at the same time positively position the clock movement within its casing and prevent direct contact of the movement with the casing, even though the clock be subjected to excessive vibrations and jarring.

A further object of the herein described invention is to provide improved means for sealing the clock casing against admission of dust and dirt to its interior, where it might seriously affect the operation of the clock mechanism and prevent its proper functioning.

Still another object of the invention is to provide improved sealing and mounting means for

the manually actuatable regulating and time setting parts of the clock mechanism.

Other important objects of the invention are to provide a novel and improved multiple-point resilient suspension for clock movements, which comprises a relatively small number of parts, which may be produced comparatively inexpensively, and which will more efficiently support the clock movement in position during long periods of use.

Other objects and features of the invention will more fully appear from the following detailed description, taken in connection with the accompanying drawing, which illustrates an embodiment thereof, and in which:

Figure 1 is a back view of a clock construction embodying the features of the herein described invention;

Figure 2 is a diametric section taken through the clock casing and movement supporting frame structure, and showing the manner in which the frame structure is supported within the casing;

Figure 3 is an enlarged detailed sectional view of the combination support and ungrounded electrical terminal connection; taken substantially on line III—III of Figure 1;

Figure 4 is an enlarged sectional view showing the manner in which the time regulating mechanism is sealed; taken substantially on line IV—IV of Figure 1;

Figure 5 is an enlarged fragmentary view in section showing the construction of the combination support and grounded electrical terminal connection; taken substantially on line V—V of Figure 1; and

Figure 6 is an enlarged fragmentary detailed view in section showing another support and the manner in which it may be utilized for bringing out the shaft of the time setting mechanism; taken substantially on line VI—VI of Figure 1.

As shown on the drawing:

As shown on the drawing in Figures 1 and 2, the clock embodying the present invention embraces a cup-shaped casing 10 which is preferably formed of a suitable metallic material and provided with a bottom wall 11 to which there is secured a frame structure as generally indicated at 12 which serves as a mounting for the electrical actuating mechanism and clock movement. This frame structure preferably contains a plurality of plate members including a back plate as shown at 13.

The clock structure to be subsequently described in detail has been found to be particularly useful in connection with clocks for use in

connection with automobiles and other vehicles. Such clocks are usually arranged to be electrically rewound at intervals. The rewinding operation sets up certain noises which in the usual arrangement are transmitted to the interior of the vehicle and prove to be a disturbing and objectionable source of noise to the vehicle occupants. Moreover, attempts have been made to mount the clock frame structure within its casing in such a manner as to prevent the transmission of such noises to the interior of the vehicle, but such attempts have in the main embodied very expensive constructions which after a time due to the deterioration of resilient rubber parts of the mounting or mounting screws becoming loosened and other causes would let the clock frame hit against the casing when the vehicle was driven over a somewhat bumpy road. Thus additional noises were set up which were disturbing to the vehicle occupants.

In the present invention, the disadvantages of the previous arrangements has been overcome by constructing a multi-point suspension, namely a three-point support, for the clock frame and the utilization of rubber mountings in such a way that the frame structure is positively held in proper position and is prevented from directly engaging with the metallic casing even though the clock is subjected to very severe vibrations over long periods of time.

In addition, the present invention embodies the novel feature of utilizing certain of the frame supports as electrical terminal connections, thus producing a structure containing a relatively few number of parts and materially decreasing the manufacturing cost of the mounting.

More specifically, the bottom wall of the casing is provided with a plurality of openings 14, 15 and 16 which are disposed in triangular relation. These openings are respectively utilized for bringing out the ungrounded terminal connection of the clock as generally shown at A, the grounded terminal connection as generally shown at B, and the hand setting mechanism as generally indicated at C.

As more specifically shown in Figure 3, the combination support and ungrounded terminal A comprises a terminal stud 17 of suitable current conducting material which is formed with a shoulder 18 between its ends. Extending in opposite directions from this shoulder are integrally formed shank portions 19 and 20. The stud is mounted on the back plate 13 by disposing it in a suitable opening 21 in the back plate, the shank portion 20 being insulated from the back plate by a suitable washer 22 of insulating material having its surfaces substantially flush with the surfaces of the back plate. Other insulating washers 23 and 24 are placed on either side of the back plate, and the washer 24 cooperates with another washer 25 to clampingly engage an electrical connection 26 with the shank portion 20. The outermost end of the shank portion 20 is riveted over the outer surface of the washer 25 and secures the stud in rigid connection with the back plate 13, but insulated therefrom.

The shank portion 19 of the stud is disposed in the opening 14 in the bottom wall of the casing and is maintained centered therein by means of a grommet 27 which is preferably constructed of a resilient insulating material such as rubber. This grommet is provided with end flanges 28 and 29 which are arranged to extend over and engage the opposite surfaces of the wall 11 adjacent the opening 14. The end surface of the

flange 29 preferably engages against an abutment washer 30 which is disposed on the shank 19 between the grommet and the shoulder 18.

The shank portion 19 is internally threaded to receive a terminal screw 31 by means of which a wire connecting lug 32 may be secured to the stud. In this construction, the lug 32 and washer 30 cooperate to form clamping elements for compressing the end flanges 28 and 29 into sealing engagement with the adjacent portion of the wall 11, and thus forms a seal which prevents the passage of dust and the like into the interior of the casing, where it may seriously interfere with the proper operation of the clock mechanism.

As shown in Figure 5, the combination mounting and grounded terminal connection B is in general similarly constructed to that for the terminal A, except that in the case of the grounded terminal the shoulder between the ends of the stud may be slightly thicker as shown at 18', and the shank 20' may be made shorter, since this end of the stud is secured directly to the back plate rather than insulated as in the case of terminal A.

Referring to Figure 6, the construction of this support differs slightly from the two previously described supports, since in this case the support is not utilized as a terminal connection, but serves as means for supporting a hand setting shaft 32' having a digitally engageable button 33 at its outermost end.

In this case the stud is provided with a shoulder portion 34 between its ends and has oppositely projecting integrally formed shank portions 35 and 36.

The end 36 is arranged to be riveted or otherwise secured in the back plate 13, and the shank portion 35 is in this case externally threaded for receiving a clamping nut 37 which cooperates with clamping washers 38 and 39 to press the end flanges of the grommet against the adjacent surfaces of the wall 11. This stud is of hollow construction and forms a bearing support for the shaft 32' which passes through the stud from the interior of the casing to the exterior thereof.

In order to provide for regulation of the clock speed, a regulating shaft 40, which is connected with the usual regulating mechanism of the clock movement, is extended through a suitable opening 41 in the back plate and provided with a head piece 42 having a diametrically extending slot 43 in its outer surface which is accessible through a suitable opening 44 in the bottom wall 11 of the casing. By inserting a screw driver or other tool in the slot 43, the shaft 40 may be rotated in opposite directions in the usual manner to increase or decrease the speed of operation of the clock movement.

The head piece 42 on its outermost surface carries an arrow 45 which is cooperatively associated with scale marks 46 spaced around the opening 44. The arrow 45 may thus be disposed adjacent the scale marks and thus indicate the adjusted position of the shaft 40 and serve as a guide in the regulation of the speed of the clock movement.

For sealing the regulating mechanism and preventing the entrance of dust and the like through the opening 44, there is provided a gasket or washer 47 which is compressed between the back plate 13 and the bottom 11 of the casing, this gasket surrounding the head piece 42. This gasket may be constructed of any suitable material, and for this purpose soft rubber has been found to be very

satisfactory, although felt or other suitable materials might be used.

From the foregoing description, it will be apparent that the present invention provides an improved and novel mounting for a clock movement, wherein the mounting means may be utilized as electrical terminals for the supply of electric current to the clock operating mechanism; a mounting which is so arranged that the movement will be resiliently supported out of direct contact with casing; which seals the casing against admission of dust and dirt to its interior, where it might seriously affect the operation of the clock movement and prevent its proper functioning; which includes a novel arrangement for bringing out the manually actuatable regulating and time setting parts of the clock movement, and sealing these parts against entrance of dust and dirt; and which provides a novel and improved multi-point or three point resilient suspension for the clock movement embodying a relatively small number of parts, thus enabling the mounting to be produced inexpensively, and which will support the clock movement in its proper position over a long period of use.

It is, of course, to be understood that although I have described in detail a preferred arrangement of my invention, the invention is not to be thus limited but only in so far as defined by the scope and spirit of the appended claims,

I claim as my invention:

1. In a clock, a casing, a frame structure within the casing for supporting the clock movement, and means for supporting said frame from the casing including a tubular stud carried by the frame and extending to the exterior of the casing, a shaft extending through and rotatably supported in said stud, and a resilient member insulatively supporting said stud in the casing.

2. In a clock, a casing having an opening therein, a frame structure within the casing, a tubular stud carried by the frame and extending through said opening, a shaft rotatably supported in said stud and projecting exteriorly of the casing, and a member resiliently supporting and sealing said stud in the casing opening.

3. In a clock, a frame structure, a casing having a wall with an opening therein, a member rotatably supported on the frame and having a head portion accessible through said opening, and a gasket surrounding said head portion having sealing engagement with the adjacent casing wall.

4. In a clock, a frame structure, a casing having a wall with an opening therein, a member rotatably supported on the frame and having a head portion accessible through said opening, and a gasket surrounding said head portion having sealing engagement with the adjacent casing wall and said frame.

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