Feb. 16, 1943. F. H. JUDKINS 2,311,396

VIBRATION-FREE MOUNTING

Filed July 10, 1942

Fig. 1.

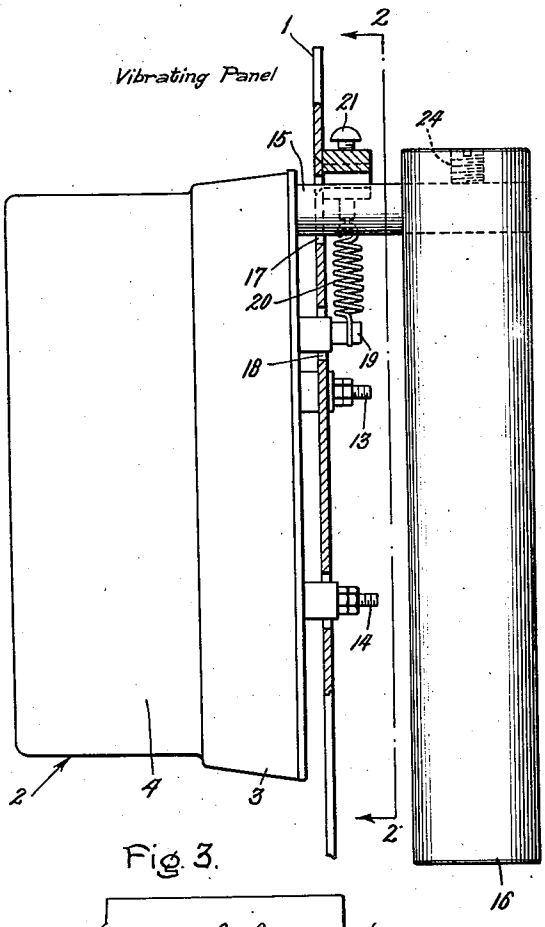


Fig. 2.

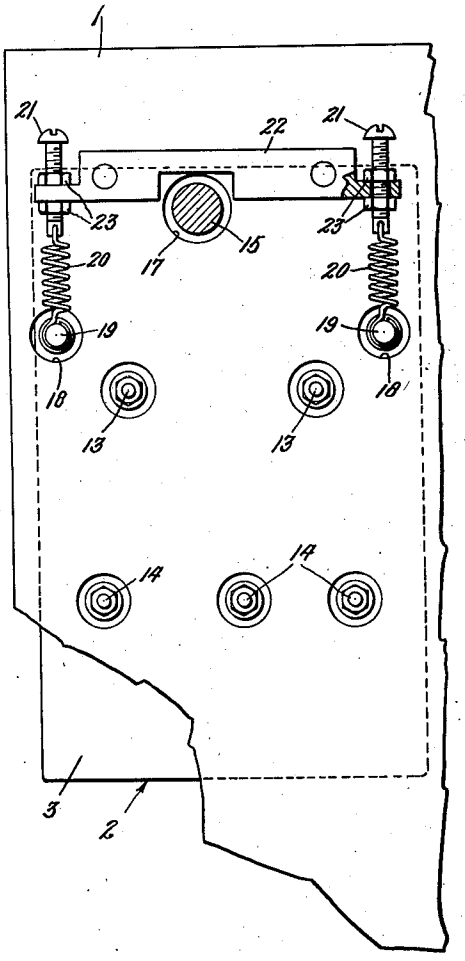
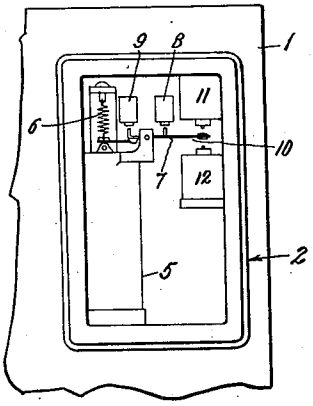


Fig. 3.



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VIBRATION-FREE MOUNTING

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2 Claims. (Cl. 248—358)

This invention relates to vibration-free mountings and has for an object the production of a simple, compact, out-of-the-way and normally out-of-sight vibration-free mounting for electrical instruments.

Electrical measuring instruments and particularly contact-making and breaking measuring instruments, such, for example, as voltage regulating relays of the contact-making voltmeter type, are adversely affected as to sensitivity, effective calibration, wear and unnecessary operation by vibration transmitted to them from their supporting means. Although vibration absorbing or isolating mounting means are generally old, they usually have one or more disadvantages, such as relatively high cost, relatively short life, relatively poor appearance, or lack of simplicity.

In accordance with the present invention there is provided a novel and simple vibration-free mounting whereby an electrical measuring instrument may be mounted on the face of a vibrating panel without taking up any more space on the panel than is taken up by the instrument itself and without altering the appearance of the instrument or the panel.

The invention will be better understood from the following description taken in connection with the accompanying drawing and its scope will be pointed out in the appended claims.

In the drawing Fig. 1 is a side elevation of a preferred embodiment of the invention, Fig. 2 is a sectional view taken on the line 2—2 of Fig. 1, and Fig. 3 is a front elevation of the panel and measuring instrument on a reduced scale.

Referring now to the drawing, in which the same reference numeral identifies the same part throughout the several views, there is shown a main supporting panel 1 on the face of which an electrical measuring instrument 2 is to be effectively surface mounted. The instrument is provided with a main base portion 3 and an enclosing casing 4. As shown by way of example in Fig. 3, it is a contact-making voltmeter. Mounted on the base 3 and within the casing 4 there is a main solenoid operating magnet 5 whose core is suspended by a spring 6. This core is connected to a pivotally mounted contact beam 7 carrying on opposite sides of its pivot point a pair of contacts for cooperation respectively with normally fixed raise and lower contacts 8 and 9 respectively. For securing firm contact engagement the outer end of the contact beam is provided with an armature 10 acted upon in a well-known manner by electromagnetic holding coils 11 and 12. Electrical connections are made to the magnet 5 by means of a pair of binding posts 13 extending outwardly from the back of the instrument, and electrical connections to the contact beam 7 and to the fixed contacts 8 and 9 are made by means of three binding posts 14 extending outwardly from the back of the base member 3.

The panel 1 may either be the instrument panel of an electric power station or it may be the control panel of a transformer-type regulator, such as a step voltage regulator or an induction voltage regulator. In either case the panel is frequently subject to vibration transmitted to it from large rotating machines located nearby. In such cases it has been found that if the base 3 of the meter is mounted directly on the panel the vibrations will cause false operation of the meter whereby its contacts close when they should not close, thus causing improper operation of the automatic voltage regulating means under the control of the voltmeter. In order to prevent this, while at the same time preserving the appearance of the panel, a backward extension in the form of a rigid rod 15 is fastened to the back side of the base 3 near its top. To the outer end of this rod 15 there is attached a weight 16. The purpose of this is to shift the center of gravity of the meter assembly to the back side of the panel 1. Ordinarily, the center of gravity of the meter is somewhere within its boundaries but by adding the weight to the back of the device the center of gravity of the combined instrument and weight is moved backward. The panel 1 is provided with an opening 17 through which the rod 3 passes and it is also provided with additional openings 18 for accommodating backwardly extending supporting posts 19. These supporting posts 19 are attached to the back of the panel through springs 20 terminating in their upper ends in adjusting screws 21 passing through a suitable bracket 22 riveted to the panel. The screws are not threaded into the bracket but pass loosely through openings therein and vertical adjustment is secured by a pair of nuts 23.

For accurately adjusting the center of gravity of the combined voltmeter and weight so that this center of gravity lies in a vertical plane passing through the screws 21 the weight 16 is provided with a set screw 24 so that the weight may be moved in or out. This also permits the weight to be adjusted angularly so as to shift the center of gravity to a particular point in the plane of the suspension springs whereby the voltmeter can be made to hang straight.

The binding posts 13 and 14 pass through the

conventional openings for this purpose already provided in the panel 1.

The spring mounting acts as a vibration damping means and prevents the vibrations of the panel from being transmitted to the voltmeter 2.

While there has been shown and described a particular embodiment of this invention, it will be obvious to those skilled in the art that various changes and modifications can be made therein without departing from the invention and, therefore, it is aimed in the appended claims to cover all such changes and modifications as fall within the true spirit and scope of the invention.

What I claim as new and desire to secure by Letters Patent of the United States is:

1. In combination, a vertical panel having mechanical vibrations, an instrument for mounting with its center of gravity in front of said panel, said instrument being adversely affected by said vibrations, a rearwardly extending weight fastened to said instrument in such a manner as to bring the center of gravity of the combined instrument and weight assembly in back of said panel, and a resilient vibration absorbing supporting connection fastened at one end to the back of said panel and at the other end to said assembly effectively vertically above its center of gravity when said instrument is in its desired position with respect to said panel.

2. In combination, a vertical panel having mechanical vibrations, an electrical instrument for surface mounting on the front face of said panel, said instrument being adversely affected by said panel vibrations, a rearwardly extending projection on said instrument passing through an opening in said panel, a weight fastened to said projection, said weight being such that the center of gravity of the combined instrument and weight assembly is at the back of said panel, and a resilient vibration absorbing support for said assembly connected between the back of said panel and said assembly effectively vertically above the center of gravity of said assembly when said instrument is in its desired position with respect to said panel whereby said instrument has the appearance of being directly surface mounted on said panel while being isolated from said panel vibrations.

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