July 29, 1947. C. M. HATHAWAY 2,424,823

GALVANOMETER MOVEMENT MOUNTING

Filed Sept. 25, 1944

Fig. 1.

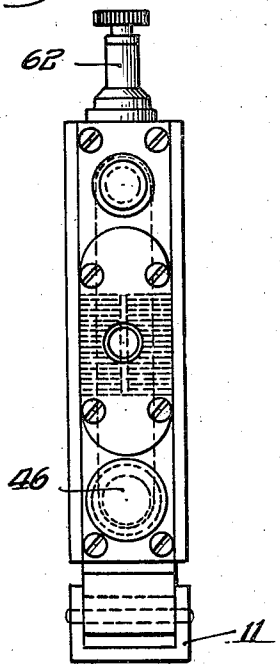


Fig. 2.

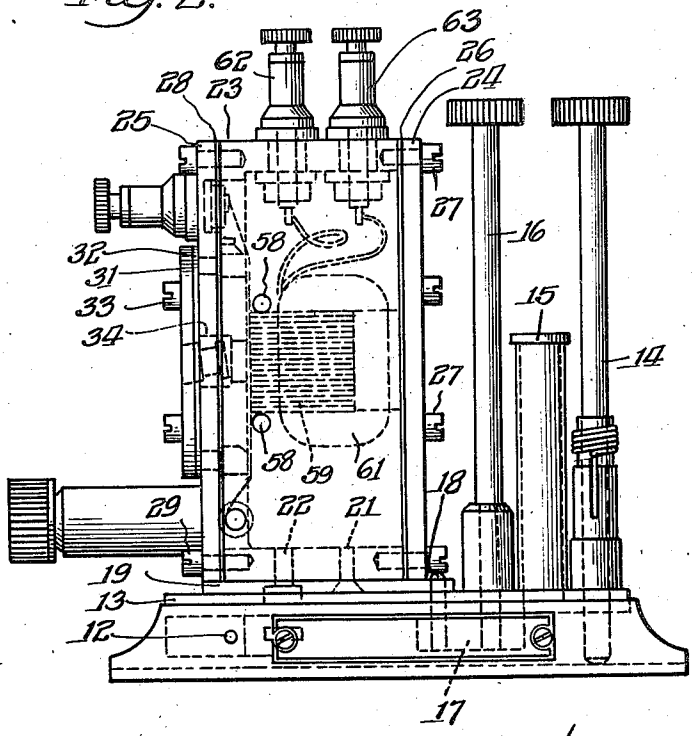


Fig. 3.

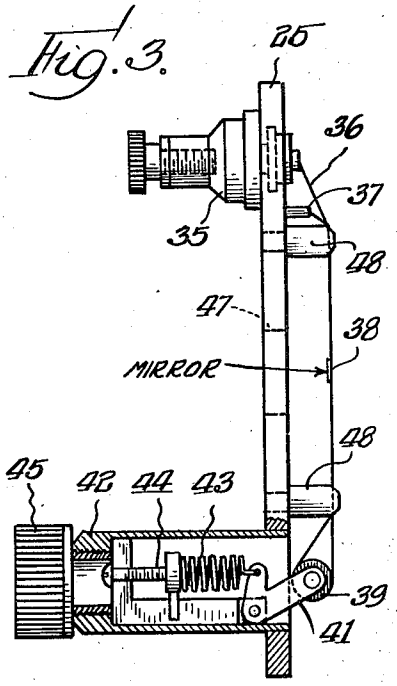
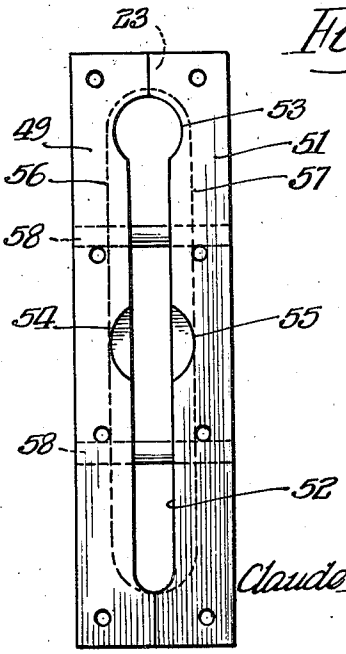


Fig. 4.



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GALVANOMETER MOVEMENT MOUNTING

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5 Claims. (Cl. 171—95)

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The present invention relates to galvanometers and more particularly to a watt galvanometer.

For certain applications it is desirable to obtain a record of electrical quantities as measured in watts, and for this purpose it is necessary to use a watt galvanometer. Frequently it is desired to obtain a plurality of records of different values at the same time and to accomplish this it is necessary to provide an oscillograph with a plurality of watt galvanometers which preferably should be relatively compact so that a plurality of traces may be obtained. In order to obtain compactness and yet avoid an expensive structure, it is necessary to provide an improved type of galvanometer cell. In accordance with the present invention an improved type galvanometer cell is constructed so that the sides are formed of two blocks of metal which by machining operations are recessed so that when the two blocks are joined together at least four surfaces of the cell block are completed.

It, therefore, is an object of the present invention to provide an improved cell block for a watt galvanometer which is simple and economical to manufacture.

It is another object of the present invention to provide an improved watt galvanometer which is relatively easy to assemble during manufacture.

Other and further objects of the present invention subsequently will become apparent by reference to the following description taken in connection with the accompanying drawing wherein

Figure 1 is a front view of a watt galvanometer constructed in accordance with the present invention;

Figure 2 is a side view of the watt galvanometer shown in Figure 1;

Figure 3 is a side view in cross section of the front plate of the cell block; and

Figure 4 is a front view of the principal body portion of the cell block.

Referring to Figures 1 and 2 there is shown a watt galvanometer having a base 11 provided with a pin 12 which extends through a depending portion of a subbase 13 so that the subbase at its other end may be raised and lowered in order to determine the elevation of the trace to be recorded by the light reflecting mirror on the galvanometer element. On the rear portion of the subbase 13 there is positioned a screw assembly 14 of conventional structure which operates to raise and lower the rear end of the subbase 13. The subbase 13 is biased downwardly by a tension spring arrangement contained within a vertical housing 15. Another adjusting rod 16 extends through the subbase 13 where it is connected to a lever 17 having an upwardly extending member 18 arranged to engage a slot in a mounting plate 19. The mounting plate 19 is secured to the body of the cell block of the galvanometer by a screw or screws 21. The body of the cell block is arranged for pivotal movement together with the mounting plate 19 by a pivot screw member 22. The structure thus far described is of a conventional type which is well known in the art and does not constitute a part of the present invention. Hence these elements are not shown or described in detail.

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The galvanometer cell constructed in accordance with the present invention includes a body portion 23, a block back cover plate 24 and a front cover plate 25. The back cover plate is provided with a gasket 26 and is secured in position by a plurality of screw members 27 so as to completely enclose the back of the cell block. The front plate 25 is also provided with a gasket 28 and the plate is retained in position by a plurality of screws 29. Mounted on the front plate 25 is a lens holder 31 provided with a suitable gasket 32 and retained in position by a plurality of screws 33. The lens holder 31 has a cylindrical portion 34 which passes through a circular aperture in the front plate 25 and extends into a circular recess in the cell body 23.

The front plate 25 is shown in greater detail in Figure 3 from which it will be seen that there is provided a binding post 35 so that a connection may be made to one extremity of a bifilar galvanometer element 36 having its other end connected to ground through a stud member 37. The galvanometer element 36 is provided with a reflecting mirror 38 and proper tension of the element is provided by a pulley 39 mounted on a bell crank 41 the position of which is determined by an adjusting mechanism contained within a housing 42. The housing contains a tension spring 43 having one end connected to the bell crank 41 and the other end connected to a threaded adjusting screw member 44. The housing 42 also serves as a filler cap for filling the interior of the cell with oil. A cap 45 is provided to close the opening 42 and to permit convenient access through the adjusting screw 44 to adjust the tension to be applied to the bifilar galvanometer element 36 by the tension spring 43. The cap 45 may be of the type having an oil resistant resilient diaphragm 46 to allow for expansion and contraction of the oil within the cell block. The front plate 25 is provided with

a circular aperture 47 for receiving the cylindrical lens portion 34. The bifilar element 36 is supported by a plurality of insulating studs 48.

The cell block body 23 is formed of two similar blocks of metal 49 and 51. Each block of metal adjacent the front face is provided with a cut away portion so that these two portions form an elongated opening 52. At the upper end the elongated opening 52 is enlarged by a generally circular portion 53 to accommodate the internal binding post structure 35. At the intermediate point along the longitudinal opening 52 the metal blocks 49 and 51 are provided with recesses 54 and 55 which are complementary to and are adapted to receive the cylindrical portion 34 of the lens holder 31. Each of the blocks 49 and 51 is also recessed from the rear to a point closely adjacent the front surface. The block 49 therefore has a recessed portion 56 and the block 51 has a recessed portion 57 so as to provide adequate space for mounting within the block 23 a magnetic core and coil. The two block portions 49 and 51 are joined together by friction pins 58 extending between the sides of the cell block body 23. The transversely extending pins 58 also serve as mounting means for supporting the magnetic core 59 which is provided with a coil or winding 61. The magnetic coil 61 is connected to suitable terminals 62 and 63 mounted at the top of the body 23. By forming the body 23 of two similar blocks of metal with recesses cut therethrough as illustrated in Figure 4, it will be appreciated that manufacturing operations are greatly facilitated and hence the cost thereof is reduced. The arcuate recesses 54 and 55 at the front of the body 23 cooperate with the cylindrical lens portion 34 to assist in accurate positioning of the galvanometer element 36 between the pole pieces of the magnetic core 59.

While for the purpose of describing and illustrating the present invention a preferred embodiment has been shown in the drawing, it is to be understood that such variations are contemplated as may be commensurate with the spirit and scope of the invention as defined in the appended claims.

This invention is hereby claimed as follows:

1. A cell for a watt galvanometer comprising a body formed of two similar recessed blocks of metal, a front cover and a back cover for said body, said recessed blocks of metal being assembled with the recesses in opposition to each other so that the body has a recess extending from the back of the body to a plane adjacent the front of the body, said recess being interconnected with the front of the body by a narrow elongated opening having adjacent the central portion thereof arcuate recesses for receiving a cylindrical member to be mounted on said front cover.

2. A cell for a galvanometer comprising a body formed of two similar blocks of metal each recessed from one surface to a plane adjacent the opposite surface and recessed by a smaller recess interconnecting said plane with the opposite surface, said blocks having a plurality of apertures transversely arranged relative to said first recesses, and a plurality of friction fit pins mounted in said apertures to assemble said blocks into a cell whereby said latter recesses form a narrow elongated opening communicating with a chamber formed by said first mentioned recesses.

3. A watt galvanometer comprising a body formed of two similar blocks of metal, and front and back covers therefor, each block of metal having a recess extending from the back of said body to a plane adjacent the front of said body, said recess being interconnected with the front of said body by a narrow elongated opening, said elongated opening having adjacent the central portion thereof arcuate recesses for receiving a cylindrical member mounted on the front cover, a plurality of friction fit pins mounted in transverse apertures in said blocks of metal to retain said blocks together to form said body, a magnetic core structure mounted within said body between said transverse pins, a coil for said core, electrical connections mounted on top of said body for connection to said coil and a vibratory galvanometer element supported on the back side of said front cover.

4. A watt galvanometer comprising a body formed of two similar recessed blocks of metal, a plurality of friction fit pins mounted in transverse apertures in said blocks of metal to retain said blocks together to form said body, said blocks of metal when assembled being provided with a recess extending from the back to a plane adjacent the front of said body, a narrow elongated opening interconnecting the front of said body with said recesses, front and back covers for said body, arcuate recesses formed in said blocks of metal adjacent the central portion of said elongated opening, a lens holder mounted on the front cover having a rearwardly extending cylindrical portion adapted to fit in said arcuate recesses, a vibratory galvanometer element supported by said front cover, a magnetic core structure mounted within said body and supported by said pins, and a coil for said magnetic core.

5. A cell for a galvanometer comprising a body formed of two similar blocks of metal, and front and back covers for said body, each block of metal being recessed from one surface to a plane adjacent the opposite surface, and a smaller recess interconnecting said opposite surface with said first recess at said plane, said blocks being assembled with recesses arranged in opposition to each other to form at said opposite surface a narrow elongated opening communicating with a larger opening formed by said first mentioned recesses, said front cover being mounted across said narrow elongated opening, and said back cover being mounted to close the larger chamber formed by said first mentioned recesses.

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