July 23, 1935. A. F. SPITZGLASS 2,008,970

INSTRUMENT

Filed July 14, 1933 2 Sheets-Sheet 1

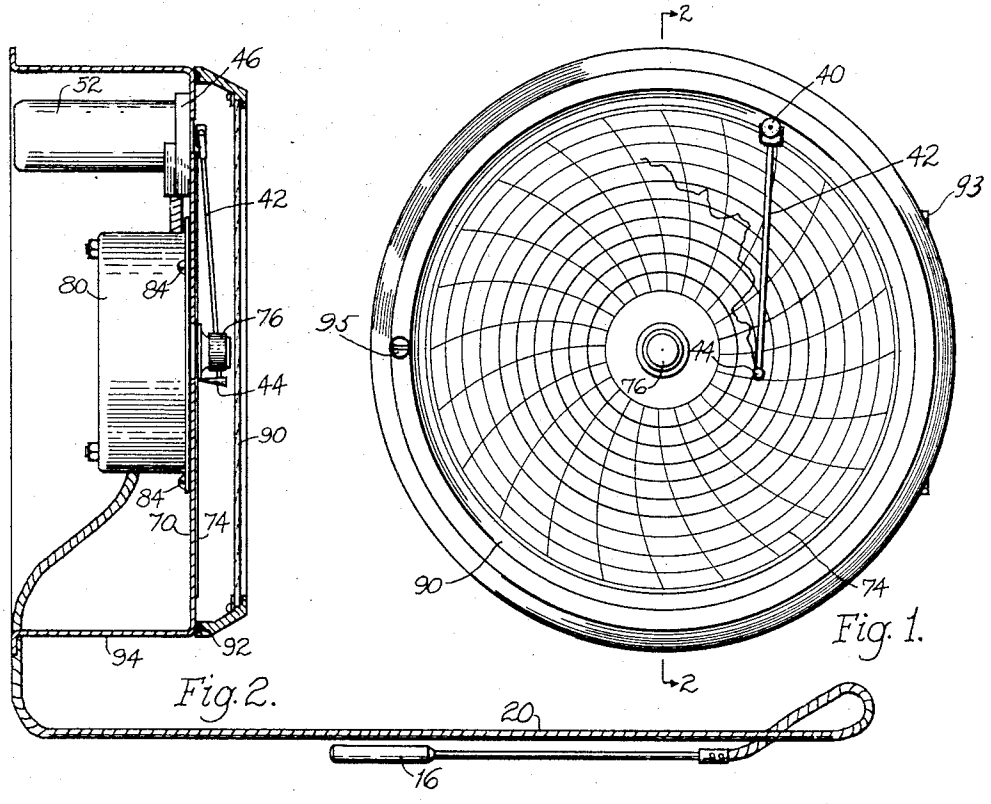


Fig. 1.

Fig. 2.

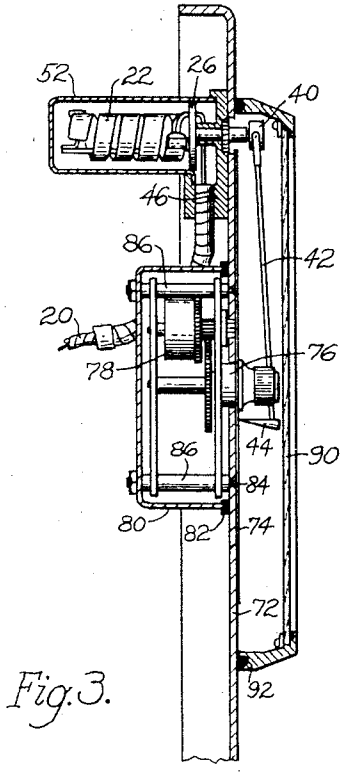


Fig. 3.

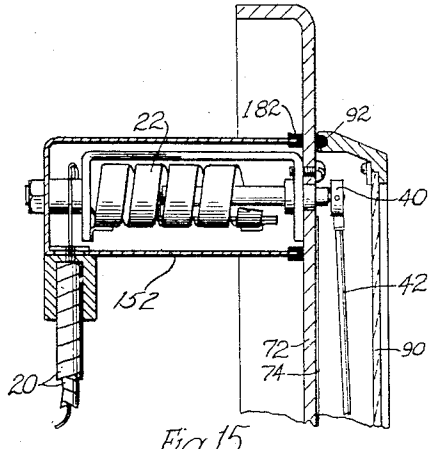


Fig. 15.

Inventor
Albert F Spitzglass
by Jno. W. McCuskey
Attorney

July 23, 1935. A. F. SPITZGLASS 2,008,970

INSTRUMENT

Filed July 14, 1933 2 Sheets-Sheet 2

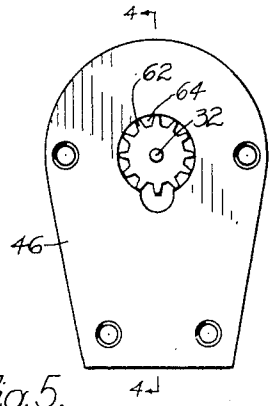


Fig. 5.

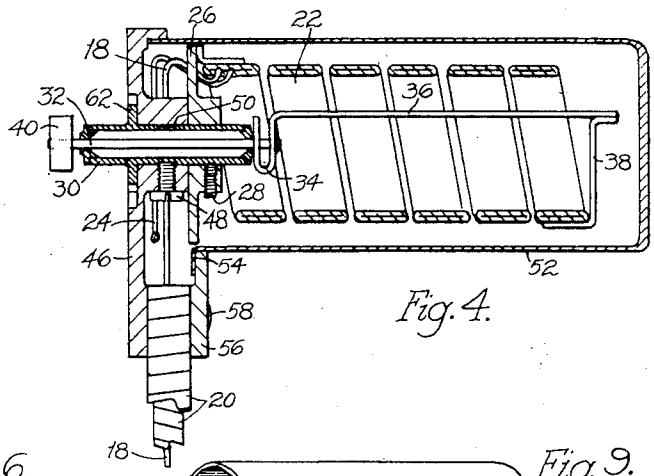


Fig. 4.

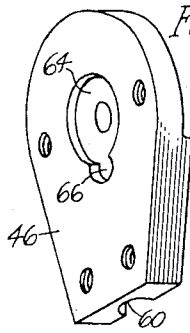


Fig. 6.

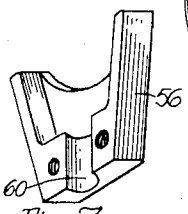


Fig. 7.

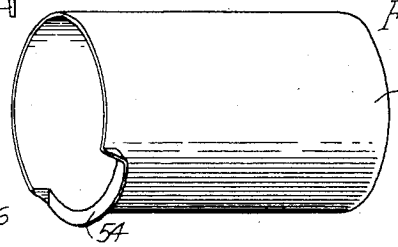


Fig. 9.



Fig. 8.

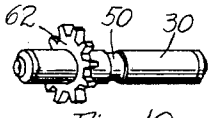


Fig. 10.

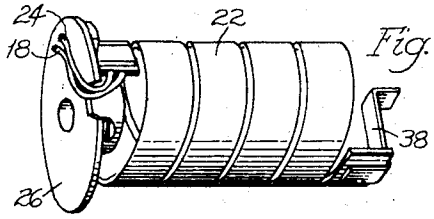


Fig. 12.

Fig. 13.

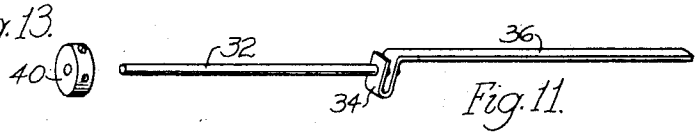
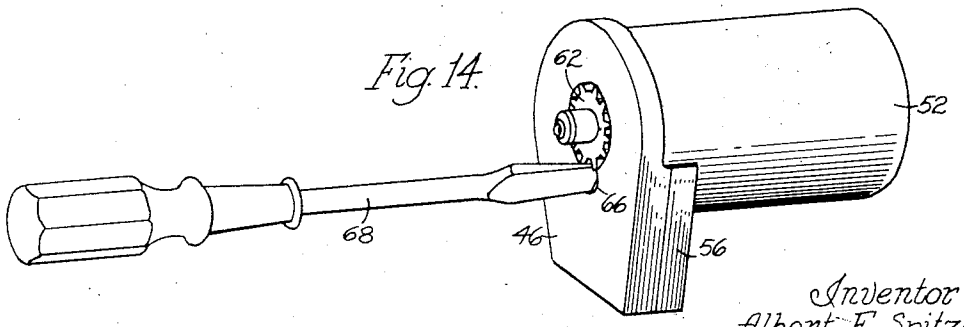


Fig. 11.

Fig. 14.



Inventor
Albert F. Spitzglass
by Jno. W. McCaskey
Attorney

Patented July 23, 1935

2,008,970

UNITED STATES PATENT OFFICE

2,008,970

INSTRUMENT

Albert F. Spitzglass, Chicago, Ill., assignor to The Republic Flow Meters Company, Chicago, Ill., a corporation of Illinois

Application July 14, 1933, Serial No. 680,389

1 Claim. (Cl. 234—1)

This invention relates to instruments and their mountings, and is illustrated as embodied in a novel recording thermometer having a remote control.

In previous instruments of this type it has been customary to provide a supporting frame or the like for the operating mechanism, on which is mounted a member providing a backing for the chart, the whole then being mounted in a dust-proof casing having a glass cover, to form a completely assembled instrument which is then mounted on an instrument panel or other support.

It is an important object of the present invention to simplify the construction and assembly of such instruments, and to lessen their cost, by utilizing the panel (or an equivalent support) as the sole support for all of the parts, by a novel arrangement which still gives a sealed dust-proof assembly.

Having this in mind, the motor mechanism for driving the chart is provided with a housing such as a seamless cup-shaped stamping, which housing is mounted in sealing peripheral engagement with the rear face of the panel or equivalent support, with the shaft or other chart driving member extending through the panel and arranged to drive a chart arranged on the front of the panel.

The thermometer, or other instrument, is also provided with a closed housing in peripheral sealing engagement with the rear face of the panel, adjacent the edge of the chart, with its operating member extending through the panel and provided with a pen or other recording or indicating element arranged to swing across the chart.

The face of the panel is provided with a glazed dished cover, hinged or otherwise mounted thereon, which swings into sealing peripheral engagement with the front of the panel and incloses the chart and the pen or its equivalent. Thus, since the motor mechanism and the instrument proper and the cover all are sealed peripherally to the panel, a sealed and dust-proof assembly is provided without any instrument casing and without the usual supporting frame.

Other features of the invention relate to an improved construction of the thermometer or other instrument which, while useful in other combinations, do especially adapt, the instrument for inclusion in the above-described assembly.

Among these features are a novel construction of instrument housing, including a cup-shaped housing for the operating mechanism and a head and cap locked to the open end thereof, and a simple and novel adjusting means for an instrument so housed and which is particularly adapted for manipulation by a screw-driver or the like from the front of a panel on the rear of which the instrument is mounted, and a novel mounting, and arrangement of the operating parts of the instrument.

The above and other features of the invention, including various novel combinations of parts and desirable particular constructions, will be apparent from the following description of the illustrative embodiment shown in the accompanying drawings, in which:

Figure 1 is a front elevation of a complete assembly, of a type where only one instrument is to be mounted on the panel;

Figure 2 is a vertical section through the assembly, on the line 2—2 of Figure 1;

Figure 3 is a section generally corresponding to Figure 2, but showing the thermometer and the motor mechanism in section, and showing a panel adapted to carry a plurality of instruments;

Figure 4 is a vertical section through the thermometer selected as an illustrative instrument;

Figure 5 is a front elevation thereof;

Figure 6 is a perspective view of the head of the instrument casing;

Figure 7 is a perspective view of the sealing cap which cooperates therewith;

Figure 8 is a perspective view of one of the fastenings for securing the head and the cap together;

Figure 9 is a perspective view of the stamped metal housing;

Figure 10 is a perspective view of the adjusting sleeve;

Figure 11 is a perspective view of the operating shaft and its connections;

Figure 12 is a perspective view of the operating means of the instrument;

Figure 13 is a perspective view of the pen-carrying member on the end of the operating shaft;

Figure 14 is a perspective view of the thermometer subassembly, showing how it is adjusted; and

Figure 15 is a section corresponding to Figure 3 but showing a different instrument subassembly.

The particular instrument selected for illustration in the embodiment of the invention herein described is a thermometer having a bulb 16 intended to be placed in the space whose temperature it is intended to measure, and which

communicates with the indicating and recording part of the instrument by a remote control such as a flexible tube 18 protected by means such as oppositely wound flat spiral wirings 20 forming a flexible protective casing.

The end of the tube 18 is soldered or otherwise sealed to the fixed end of a flat hollow Bourdon tube 22 which is wound to form a helix of substantial size. The bulb 16 and the tube 18 and the helix 22 are filled in the usual manner with a gas under pressure, a gas being selected whose changes of temperature in bulb 16 give the desired action of the helix 22 in winding and unwinding about its axis.

In order to avoid disturbing the connection 18 in calibrating, a separate tube 24 may be attached to the fixed end of the helix 22. The instrument is then, in assembling it, deliberately filled with too much gas. In calibrating it, part of the gas is released through tube 24, and when the desired gas pressure is reached the tube 24 is pinched off and soldered shut. Thereafter corrections by way of calibration are made by introducing more gas through the tube 24 or releasing some there-through, and each time the tube is again pinched off and re-soldered.

One end of the helix 22 is soldered or otherwise fixed to a head 26 which in turn is secured (by a setscrew 28 or the like) to an adjusting sleeve 30. The sleeve 30 has in its ends bearings in which there is journaled an operating shaft 32. This shaft has mounted on or affixed to its end, within the helix 22, a member formed with a crank 34 having an extension 36 parallel to but spaced from the axis of the helix.

The free end of the helix has soldered or otherwise secured thereto a radial connecting arm 38 which is soldered or otherwise firmly secured to the extension 36. Thus the twisting motion of the helix 22, due to changes of temperature around the bulb 16, is transformed by the arm 38 and the extension 36 and the crank 34 into rotary motion of the shaft 32. As is well understood in this art, in calibrating the instrument the arm 38 may be moved along the helix 22 in such a manner as to bring into operation more or less of its length.

The operating shaft 32 has fixed at its front end a part 40 carrying any desired indicating or recording device, shown as an arm 42 carrying a pen 44.

The adjusting sleeve 30 is journaled in a central boss of a novel head 46, axial movement being prevented by a setscrew 48 extending into an annular groove 50. The head 46 has abutting thereagainst a closed and preferably drawn metal seamless housing 52 which incloses the helix 22 and associated parts. The housing 52 may be formed at its edge with a depressed lip 54 engaged and locked by a closure member 56 secured to the head 46 by fastenings such as screws 58.

If desired to make a factory assembly of the instrument, screws 58 may be countersunk and their heads covered by sealing wax or the like.

The head 46 and the closure member 56 are formed with registering grooves 60 forming a passage through which the remote control tube 18 passes, and which head and cap grip and hold the upper end of the flexible protective casing 20, as shown in Figure 4. Thus the instrument is in itself a sealed and fully protected subassembly

In order to facilitate the zero adjustment of the instrument, which is accomplished by turning the entire helix with the parts attached thereto, by rotating the sleeve 30, the sleeve is provided with operating means such as a spur gear 62 seated in a circular socket 64 in the face of the head 46. A second circular socket 66 communicates with the socket 64 so that, as shown in Figure 14, a screw-driver 68 or the like may be inserted and rotated therein, forming in effect a two-toothed gear meshing with and driving the spur gear 62. This zero adjustment is ordinarily made when the entire assembly has been put together, and with a chart in place.

According to an important feature of the invention, an instrument such as the one described above is intended to be mounted directly on the rear face of a panel or support 70 (Figures 1 and 2) or 72 (Figure 3) by means of suitable screws or other fastenings, in peripheral sealing engagement therewith and with the operating member 32 extending through to the front of the panel. When so mounted, the arm 42 with its pen 44, or an equivalent indicating or recording member, is secured in place to cooperate with a chart 74 on the face of the panel.

The chart 74, preferably a detachable circular chart of paper, is shown rotatably mounted on the end of a shaft or other operating member 76 extending through the panel. The shaft 76 forms part of any suitable clockwork or other motor mechanism 78 of any desired type, which is housed in a tight cup-shaped casing 80 having at its edge a rubber gasket 82 in sealing engagement with the rear face of the panel. The motor mechanism is held in place by screws 84 or the like fastenings, four being shown.

In Figure 2 these fastenings engage a flange of the housing 80, and the sealing gasket is a flat ring of rubber arranged between the rear face of the panel and this flange. In Figure 3 the fastenings 84 are shown threaded into posts 86 forming part of the motor mechanism 78, and the gasket 82 is a U-section rubber ring embracing the edge of the housing 80.

In both arrangements, a glazed dished cover or door 90, provided if desired with a rubber sealing gasket 92, is hinged or otherwise mounted at 93 on the face of the panel, in sealing peripheral engagement therewith, and covers over the chart 74 and the arm 42 with its pen 44. A latch or fastening 95 of any desired form may be provided for the cover. Thus the entire assembly, although having no outer casing and no separate supporting frame, is completely housed and is fully protected.

The panel 70 shown in Figure 2 is intended for use with a single instrument, and is dished and drawn rearwardly to form a protective flange 94 encircling the instrument 52 and the motor mechanism 80. This flange has in its edge a notch through which the remote control 18—20 passes. The panel 72 shown in Figure 3 is intended to be a large panel carrying a number of instruments.

It is only necessary to drill through the panel a number of holes for the shafts 32 and 76, for the fastenings holding the instrument and the motor mechanism, and for the fastenings for the door 90, and the complete assembly may quickly and easily be put together, as easily in fact as one of the old instruments can be mounted on a panel.

One advantage of the new instrument is that when it is necessary to repair the recording instrument, the entire instrument may readily be removed and returned to the factory. In the

meantime it is replaced by a spare instrument, which has previously been calibrated at the factory, and which requires adjustment only as to its zero setting.

In the arrangement of Figure 15, the casing 152 of the instrument is open at the front, and is provided with a rubber gasket 182 in sealing engagement with the rear face of the panel, where it is held by suitable machine screws or other fastenings which pass through the panel. The illustrated instrument subassembly shown in detail in Figures 4 to 14 is claimed in my divisional application No. 19,558, filed May 3, 1935.

While one illustrative embodiment has been described in detail, it is not my intention to limit the scope of the invention to that particular embodiment, or otherwise than by the terms of the appended claim.

I claim:

An instrument comprising a support, a housed motor mechanism in sealing engagement with the back of the support and having a shaft projecting through the support and provided in front of the support with means for carrying a chart, a housed instrument in sealing engagement with the back of the support and having an operating member projecting through the support just beyond the periphery of the chart and having in front of the support a marking element acting on the chart and operated by said member, and a cover mounted on the front of the support and in sealing peripheral engagement therewith and which houses between itself and the support said chart and the end of said operating member and said recording device.

ALBERT F. SPITZGLASS.