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OPERATING MEANS FOR INDICATING SYSTEMS AND APPARATUS

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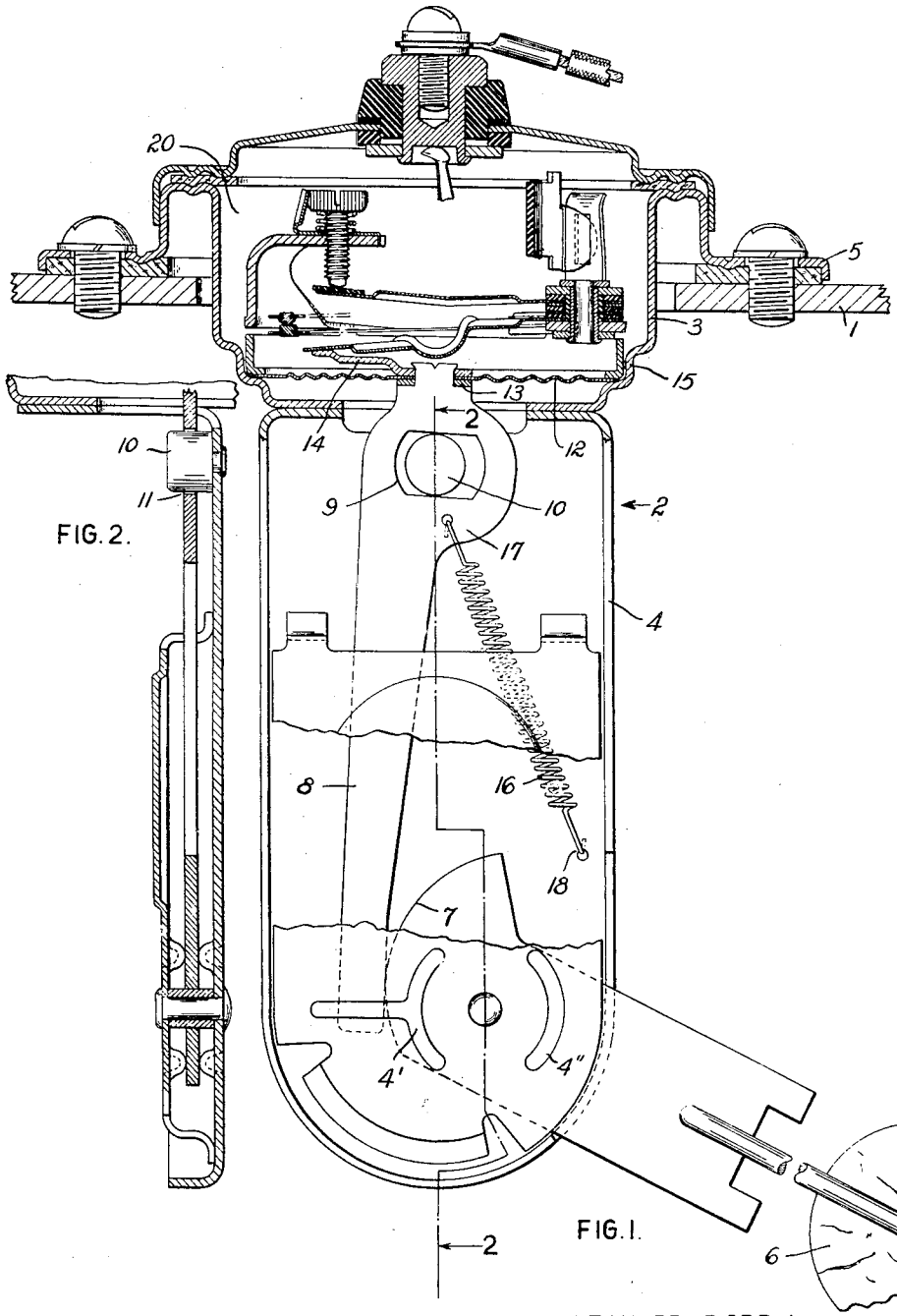


FIG. 2.

FIG. 1.

LEONARD BODDY, INVENTOR.

BY Alois W. Graf

ATTORNEY.

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OPERATING MEANS FOR INDICATING SYSTEMS AND APPARATUS

Leonard Boddy, Ann Arbor, Mich., assignor to The Anderson Company, Gary, Ind., a corporation of Indiana

Original application September 15, 1936, Serial No. 100,918. Divided and this application September 20, 1937, Serial No. 164,891

5 Claims. (Cl. 200—84)

This invention relates to electrical indicating systems and apparatus, and relates more particularly to the mechanical operating means for such systems and apparatus.

This application is divisional of my co-pending application, Serial No. 100,918, filed September 15, 1936, Patent No. 2,133,077, granted October 11, 1938, and reference will be had thereto for a more complete understanding of the subject matter of certain related parts of my invention.

In this application, I have described more particularly the operating linkage of the indicating system of my prior invention.

The said improved operating means may be adaptable for use in various types of transmitters, such as liquid level, oil pressure and the like.

It is a primary object of my invention to provide improved operating means for an electric circuit controller of the type wherein the current flow is controlled by the position of a movable element.

Another object of my invention is to provide such improved operating means adapted to an electrical indicating system which can be simple and economically manufactured.

Other objects of my invention and the invention itself will become increasingly apparent from a consideration of the following description and drawing wherein:

Fig. 1 is an elevational view, partly in section, of a transmitter unit embodying my invention;

Fig. 2 is a cross-sectional view taken along line 2—2 of Fig. 1.

Referring now to the drawing, in all of which like parts are represented by like reference characters, I have indicated generally at 1 the top wall of an automotive vehicle gasoline tank or similar liquid container on which is mounted a transmitter unit generally indicated at 2, the transmitter being connected through a wire with an electro-responsive indicator. For a further description of the wiring and indicator of such an electrically operable indicating system reference should be had to my above mentioned parent application.

The transmitter 2 comprises an enclosed housing portion 3 and a depending generally channel shaped arm 4 wherein the operating linkage means of my invention are more specifically contained. The container wall 1 is perforated and the arm 4 and a portion of the housing is projected therethrough, the housing being provided with a radially outwardly extending flange 5 riveted or otherwise secured to the container wall 1. The arm 4 pivotally supports a float element 6 whereby the float element will be relatively rotated in response to variation in liquid level.

In Fig. 1, the inner end of the float element 6 comprises a camming face 7, adapted to actuate a generally vertically disposed lever 8. Guide means are provided in the form of inwardly extending projections formed by grooves 4' and 4'' impressed in the walls of arm 4, which tend to restrain the movement of the lower end of lever 8, and the inner end of element 6 in the plane thereof. The lever 8 adjacent its upper end is provided with an elongated generally rectangular perforation 9 formed with substantially parallel long sides and substantially arcuate short sides for the reception of a circular pin 10 rigidly secured to the depending arm 4 as best shown in Fig. 2. The pin 10 is preferably disposed in the perforation 9 with a small clearance 11 allowed therebetween.

The upper end of the lever 8 is secured to a diaphragm 12, the diaphragm being provided with a central perforation within which is secured, in a suitable manner as by soldering, a metal washer 13, the washer being slotted whereby a neck portion of the lever 8 may project upwardly therethrough and also through an operating arm 14 which is soldered or otherwise secured to the washer 13. The neck portion of the lever 8 is then flanged over whereby the lever 8 and the arm 14 are rigidly interconnected with each other, and with the diaphragm 12, and movement of the lever 8 will correspondingly move the arm 14.

The diaphragm is provided with an upstanding peripheral flange and is adapted to be seated within and secured by soldering or the like to a generally cup form portion 15 of the housing. The housing portion 15 has a perforated base permitting the lever arm to be projected therethrough and since the pin 10 prevents longitudinal movement of the lever 8 it is constrained to rock about the pin 10 on the upper side of the perforation 9 under lateral movement of the lowermost end of the lever effected by the camming face 7 of the float element 6.

A spring 16 is secured to the lever 8 adjacent the perforation 9 as shown at 17 and to the depending arm 4 laterally of the point of attachment to the lever, as shown at 18, whereby there will always be a tendency to rotate the lever in a counter-clockwise direction, as viewed in Fig. 1 insuring that the lever 8 will always be maintained in contact with the camming surface 7 of

the float element 6 and the float in contact with the liquid surface.

It will now be understood that when the container is substantially filled with liquid that the float element 6 will be in a substantially horizontal position or the float will be above the point of support of the float element 6 and the camming surface 7 thereof will rock the lever 8 laterally to a considerable degree and in turn the associated operating arm 14 will be rocked so that its free end moves upwardly. As the liquid level within the container decreases, the degree through which the lever 8 is rocked decreases and the free end of arm 14 has a definite position corresponding to a given liquid level and this controls the current passing through the transmitter unit indicated generally at 20 to the indicating unit as further illustrated in applicant's above mentioned co-pending application. The arrangement can be included in a system for indicating oil pressure and the like in a similar manner.

Although I have shown and described modifications of my invention, I contemplate that numerous and extensive departures may be made therefrom without departing from the spirit of my invention and the scope of the appended claims.

Having thus described my invention, what I claim is:

1. In an electric circuit controller of the type wherein the current flow is controlled by the positioning of a movable element, a fixed support, a lever movable to actuate the movable element, means rockingly connecting the lever with the support adjacent an end thereof, the lever being provided with a transversely extending slot spaced from said end, guide means projected inwardly for slideably engaging the lever and permitting oscillatory lever movement, and a camming element engageable with the movable lever at a point substantially spaced from the rocking support portion to variably rock the lever.

2. In an electric circuit controller of the type wherein the current flow is controlled by the positioning of a movable element, a diaphragm secured to said movable element, a fixed support, a lever secured to said diaphragm and movable to actuate the movable element, the lever being provided with a transversely extending slot receiving the support whereby the lever may be rocked about said support, said slot having a surface engageable with said support to compensate for lateral displacement of the lever and to restrain said lever against longitudinal movement, and a camming element engaging the lever at a point substantially spaced from the rocking support portion to variably rock the lever.

3. In an electric circuit controller of the type wherein the current flow is controlled by the positioning of a movable element, a lever rigidly secured to the movable element and support to pivot substantially about the point of securement, a fixed support spaced from said pivot point, the lever being provided with a transversely extending slot through which the fixed support is projected, said slot having a surface in engagement with said support to compensate for lateral displacement of said lever whereby the lever is constrained to rock in a fixed path, a camming element substantially spaced from the fixed support and engageable with the lever to variably rock the lever, and resilient means maintaining the lever in contact with the camming element.

4. In an electric circuit controller of the type wherein the current flow is controlled by the positioning of a movable element, a flexible support element, a lever engaging the support element and movable element to actuate the movable element, a rigid support restraining lateral shifting of the lever in the plane of support but permitting rocking of the lever about an axis disposed substantially in the plane of the support, said rigid support being spaced from the flexible support and slideably engaging the lever to constrain lever movement to a fixed path, a camming element substantially spaced from the fixed support and engageable with the lever to variably rock the lever, and resilient means associated with the lever to maintain the lever in contact with the camming element.

5. An electric circuit controller as defined in claim 4 and wherein the camming element and the lever portion engageable therewith are restrained to move in a given plane by guide elements slideably engaging each side of the lever and camming element.

LEONARD BODDY