

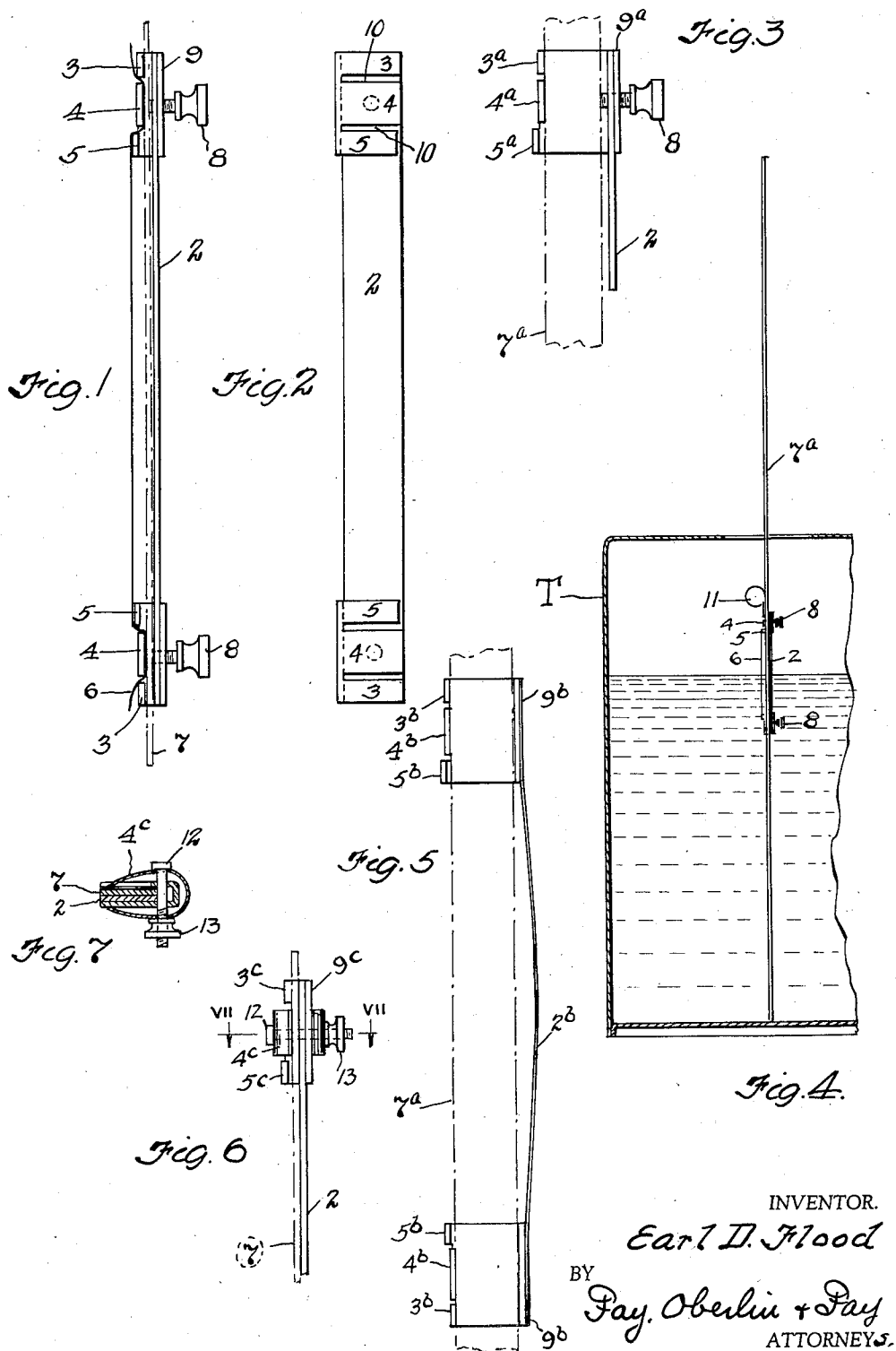
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E. D. FLOOD

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GAUGING MEANS

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INVENTOR.

Earl D. Flood

BY

Pay. Oberlin + Pay
ATTORNEYS.

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GAUGING MEANS

Earl D. Flood, Cleveland Heights, Ohio, assignor
to The Flood Company, Cleveland, Ohio, a corporation of Ohio

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10 Claims. (Cl. 73—120)

In patent application of Earl D. Flood and John A. Hannum, Serial No. 650,037, filed January 3rd, 1933, there is set forth a gauging means involving a liquid-affected strip adapted to be immersed in part in the liquid to determine the true liquid level, suitable calibrated support means being connected. In the present invention, certain further developments and improved features for mounting and applying the liquid-affected element are had, such that a device of this character may be very conveniently operated, even by those lacking in special skill and experience. Other advantages and objects will appear as the description proceeds.

To the accomplishment of the foregoing and related ends, the invention, then, comprises the features hereinafter fully described, and particularly pointed out in the claims, the following description and the annexed drawing setting forth in detail certain illustrative embodiments of the invention, these being indicative however, of but a few of the various ways in which the principle of the invention may be employed.

In said annexed drawing:—

Fig. 1 is an edge view in elevation of an embodiment of the invention; Fig. 2 is a face view, the liquid-affected strip being omitted; Fig. 3 is a side elevational view of a modified form; Fig. 4 is a vertical sectional view of a tank showing my gauging means in operation; Figs. 5 and 6 are side elevational views of modifications; and Fig. 7 is a transverse sectional view taken on a plane substantially indicated by line VII—VII, Fig. 6.

Referring more particularly to the drawing, there is shown a bar frame-piece 2 having means for holding a liquid-affected element, and more particularly clips or clip-tongues, illustrated as a series of tongues 3, 4, 5, at each end of the bar 2. The tongues are separated from each other a sufficient spacing to allow insertion of the liquid-affected element, which is illustrated in the form of a cellulosic strip 6, such as a suitable paper having a coating of an agent which is visibly changed by contact with the liquid to be gauged. Since the detail as to this is not a specific feature of the present invention, it is sufficient here to state that the strip, as of cellulosic material, such as paper, reverted cellulose, cellophane, or any suitable esterified cellulose, is coated or surfaced with an indicator agent, which may be a dye of a character to be affected by the liquid, and registering a visible height-indication as a result of its contact with the liquid, such registration persisting for at least a sufficient time

to allow of convenient withdrawal and reading.

At each end of the bar 2 a semi-housing is provided to permit the insertion or connection with a suitably graduated support with which the liquid-affected element is to be associated. For gauging large tanks, such support may be a metallic tape 7, suitably graduated or calibrated, which may be of detail as already known in the art, and for securing the bar to such graduated support, means are provided, preferably in association with the semi-housings aforementioned. A convenient means to this end may comprise screw-threaded elements, such as set-screws 8 in semi-housing members 9, these being for instance of U-shaped sheet metal joined to the respective ends of the bar. Desirably, the member 9 also provides the tongue-elements at the front of the bar, and this may be accomplished by slotting as at 10, Fig. 2, such as to leave the separate tongues 3, 4, 5. Certain of the tongues, as tongues 5, are desirably set in an offset plane, with respect to the remainder, and in this manner the cellulosic strip 6 is not only more readily positioned in the slottings 10, a sufficient frictional taut holding being incurred, but the strip in its exposed portion is positioned adequately clear of the support-surface.

Where smaller tanks are to be gauged, a stiff rod, rather than a metallic tape, is of more usual advantage, and for this, the jaws of the semi-housings at the ends of the bar 2 may be correspondingly widened, as indicated in Fig. 3, the front portion of the semi-housing carrying or providing the tongues 3a, 4a, 5a, the semi-housing member 9a again carrying suitable securing means, as for instance set screws 8. In this form, as in that described foregoing, the gauging-rod 7a fits within the jaws of the semi-housing members 9a, and allows the liquid-affected strip to be extended in exposure between the two sets of clip or tongue elements.

The manner of use will be clear from the foregoing. With the bar 2 clamped onto the graduated gauge-support 7a, the set screws 8 being tightened, and the liquid-affected paper strip 6 being positioned in holding relation in the respective sets of clips or tongues at the ends of the bar, the device is dipped into the tank T, Fig. 4. While the length of the bar 2 may be of any extent desired, ordinarily it is advisable to restrict its length to a few inches, since it is not necessary that more of the liquid-affected strip 6 be immersed below the surface of the liquid than is essential to provide a clear registration. The approximately-required position of the bar 2 with

its indicator strip 6 may of course be easily known, so that the device may be clamped into the proper position on the graduated support for the gauging operation. With the assemblage thus dipped into the liquid, and the end of the graduated support in contact with the bottom of the tank, the total height of the liquid is accurately registered on the indicator-strip 6, and after withdrawal, may be read off on the calibration of the graduated support. By reason of the absence of creeping, and the absence of loss of effect by evaporation from the indicator strip, the liquid-level line is accurately shown, without errors such as heretofore encountered by the mere dipping of graduated rods or tapes.

As a further refinement, the bar 2 may carry as an upper extension (see Fig. 4) a holding means for a roll or spool of the indicator strip, and this may conveniently take the form of a holder or box 11, open above to admit insertion of the spool or roll, and having a slot or opening below, through which the tape is fed out to the clips on the ends of the bar. By such arrangement, after an exposed length of the strip 6 has been used, the strip may be drawn down further, exposing a new area, and the used surplus below may be torn off.

Instead of a form of clamping means requiring screw-threaded setting, I may in some cases employ a frictionally held form, as for instance in Fig. 5, a spring-engagement for the semi-housing members 9b, the tongues 3b, 4b, 5b, having the relation as afore-described. The spring means, desirably also instead of being a separate spring element, may be combined as the bar 2b itself. That is, the latter is given a set such that it has to be slightly deformed in order to assemble the semi-housings 9b on the graduated support 7a, and when in such position, the resiliency of the bar 2b holds the device tight by frictional engagement. The indicator-tape is threaded through and held by the tongues 3b, 4b, 5b, as already described.

In some cases, instead of a longitudinal spring-element on the lines shown in Fig. 5, I may apply bow-string elements at each end of the bar and transversely thereto, as shown in Figs. 6 and 7 particularly. The semi-housing 9c carries or provides tongues 3c, 5c, while the bow-spring element 4c provides the intermediate tongue, and also the securing means. Associated with the resilient element 4c is a regulating means, as for instance a bolt 12 with adjusting nut 13 to facilitate regulation of the pressure upon the assembly. In this form, the graduated support or tape 7 fits into the recess of the semi-housings 9c; the indicator paper strip is threaded through the tongues, under tongues 4c, and with the device in desired position, the nuts 13 are tightened to hold the assemblage.

As thus seen, gauging, as for instance of motor fuel or other hydrocarbon products, may be quickly and conveniently and accurately performed. The device being of a character to be easily applied and used, and having the particular advantage of a high degree of accuracy, even with inexperienced users.

Other modes of applying the principle of the invention may be employed, change being made as regards the details described, provided the means stated in any of the following claims, or the equivalent of such, be employed.

I therefore particularly point out and distinctly claim as my invention:—

1. Gauging means, comprising a bar, clip-

means thereon for holding a liquid-affected strip, a roll-holder for such strip on the upper end of the bar, and means for securing the bar to a graduated support.

2. Gauging means, comprising a bar, a graduated support extending from above the surface of the liquid to be gauged to the bottom of the tank, clip-means on said bar for holding a liquid-affected element, a casing for a roll supply of such liquid-affected element, said casing having a slot below for feed of the roll to the clip-means, and means for securing the bar to the graduated support.

3. Gauging means, comprising a bar, a semi-housing at each end for insertion of a graduated support, and clip-tongues on each semi-housing, including resilient bows with screw-threaded means for regulating the same.

4. Gauging means, comprising a bar, a semi-housing at each end for insertion of a graduated support, clip-tongues on each semi-housing, and means for clamping a strip of liquid-affected material to said bar, the graduated support completing the assemblage, said means including a transverse bow-spring at each end of the bar and screw-threaded means for regulating the pressure of said bow-spring.

5. Gauging means, comprising a liquid-affected strip and means for dipping the lower part of the said strip in a liquid while exposing its upper part to air, said means including a bar, a graduated support extending from above the surface of the liquid in a tank to be gauged to the bottom of the tank, tongues on said bar for holding said liquid-affected strip, tongues on said bar for engaging the graduated support, and spring means for binding said tongues against said support.

6. Gauging means, comprising a liquid-affected strip and means for dipping the lower part of the said strip in a liquid while exposing its upper part to air, said means including a bar, a graduated support extending from above the surface of the liquid in a tank to be gauged to the bottom of the tank, tongues on said bar for holding said liquid-affected strip, tongues on said bar for engaging the graduated support, and screw-threaded means for binding said tongues against said support.

7. Gauging means, comprising a liquid-affected strip and means for dipping the lower part of said strip in the liquid while exposing its upper part to air, said means including a graduated support extending from the floor of a tank to be gauged to above the liquid in the tank, a bar, tongues on said bar for holding said liquid-affected strip, and tongues on said bar for holding same to said graduated support with the liquid-affected strip in exposure above and below the liquid surface.

8. In a device of the character described, a graduated support adapted to be positioned in a receptacle the liquid contents of which are to be measured, an elongated liquid level indicator provisionally adjustable along said support to the estimated liquid level, said indicator including a liquid affected element for partial immersion in the liquid and adapted to give a sharp line indication of the level of the liquid in said receptacle.

9. In a device of the character described, a graduated support adapted to be positioned in a receptacle the liquid contents of which are to be measured, an elongated liquid level indicator provisionally adjustable along said support to the estimated liquid level, said indicator including a liquid affected element for partial immersion in

the liquid and adapted to give a sharp line indication of the level of the liquid in said receptacle, said indicator also including a bar, clip tongues at the ends of said bar for holding said liquid
5 affected element therebetween, and means for adjustably securing said bar to said graduated support.

10. In a device of the character described, a graduated support adapted to be positioned in a
10 receptacle the liquid contents of which are to be measured, an elongated liquid level indicator pro-

visionally adjustable along said support to the estimated liquid level, said indicator including a liquid affected element for partial immersion in the liquid and adapted to give a sharp line indication of the level of the liquid in said receptacle, said indicator also including a bar, clip
5 tongues at the end of said bar for holding said liquid affected element therebetween, and a spring for adjustably securing said bar to said graduated support. 10

EARL D. FLOOD.