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LEVEL GAUGING DEVICE

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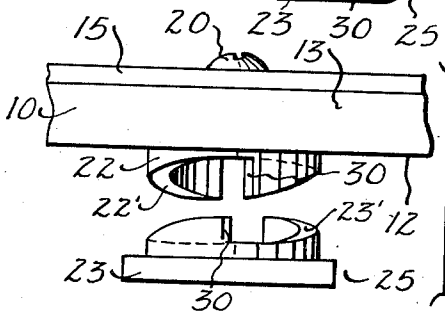
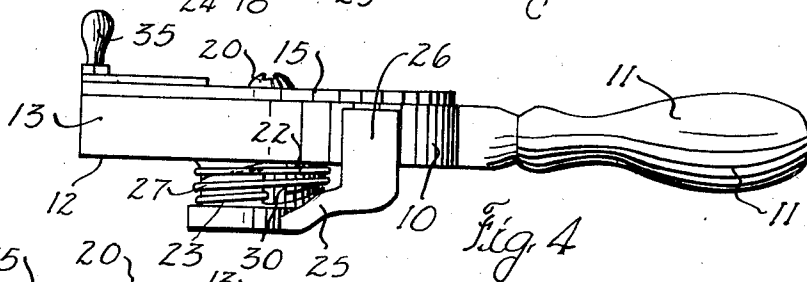
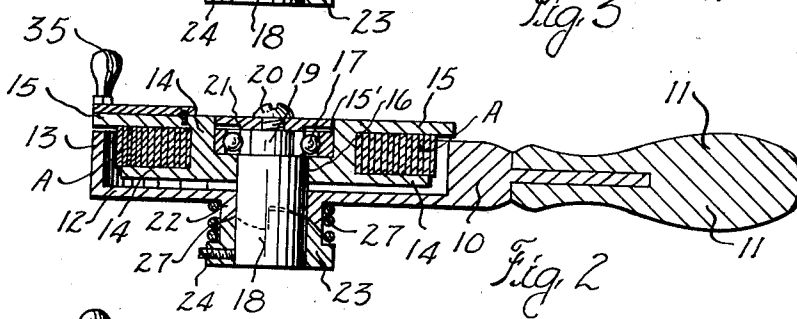
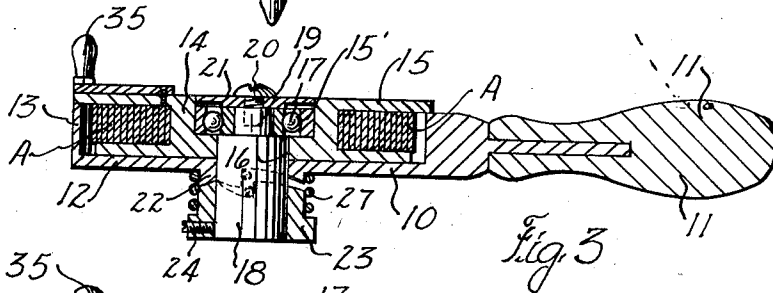
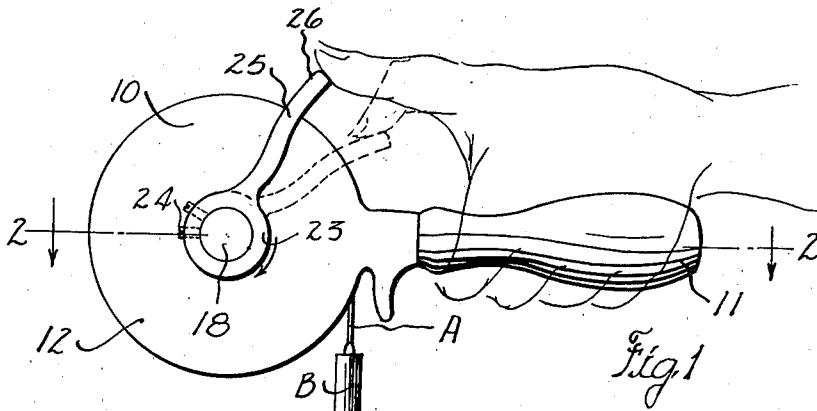


Fig 5
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LEVEL GAUGING DEVICE

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This invention relates to new and useful improvements in level gauging devices.

One object of the invention is to provide an improved device for measuring the quantity of liquid in a tank or other container.

A particular object of the invention is to provide a gauge device including a simple braking means arranged to be operated with the same hand in which the device is held, whereby the descent of the weighted tape line may be instantly stopped and the unwinding of the tape reel checked and also stopped to prevent undue slack in the line when measuring.

Still another object of the invention is to provide an improved level gauging device including a reel for receiving the measuring tape, said reel being mounted within a casing and movable laterally with relation to the side wall thereof whereby said reel may be engaged with said wall to form a brake to stop rotation of the reel; the operating means for the movable reel being such that the operator may hold the device and control the operating means with one hand.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawing in which an example of the invention is shown, and wherein:

Figure 1 is a side elevation of the level gauging device, constructed in accordance with the invention and showing the parts in braking position in full lines and in released position in dotted lines,

Figure 2 is a horizontal cross-sectional view taken on the line 2—2 of Figure 1,

Figure 3 is a view, similar to Figure 2 showing the reel in braking engagement with the side wall of the casing,

Figure 4 is a plan view of the device, and

Figure 5 is a plan view of the brake cams.

In the drawing the numeral 10 designates a circular shell or casing having a suitable handle 11 extending substantially radially therefrom. The head includes a flat side plate 12 and an annular marginal flange 13 extending from said plate and at substantially right angles thereto. A reel 14 is journaled in the head and the outer side of the reel forms a closure for the open side of said head.

The outer side or portion of the reel includes a circular plate or disk 15 which overhangs the

edge of the flange 13 so as to frictionally engage the latter and produce a braking action. At the same time that the disk engages the edge of the flange the reel engages the side plate 12, whereby the braking action is amplified. By moving the reel into the head, the brake is applied; and by moving the reel out of the head, the brake is released.

The reel is provided at its center with an annular box 15' and an axial bore 16 extending from the box through the inner side of the reel. A ball bearing member 17 is snugly mounted in the box, as is shown in Figures 2 and 3. A stub axle 18 is rotatably and slidably mounted in the bore 16 so as to abut the bearing member 17 and has a reduced trunnion 19 extending into the bearing member and receiving a screw 20, whereby a cap 21 is held in the outer end of the box for closing the latter.

From the foregoing it will be seen that the reel 14 is rotatably supported by the bearing member 17 on the axle 18. The axle projects through an annular boss 22 on the outer side of the plate 12 and has fastened on its outer end a collar 23. The collar is fastened on the axle by means of a set screw 24, as is shown in Figure 3. The boss 22 is provided with inclined cams 22' and the collar 23 is formed with complementary cams 23'. These cams are so inclined that upon movement of the collar 23, in a counter-clockwise direction (Figure 1), the axle will be slid so as to draw the reel 14 into the head 10, whereby the disk 15 will engage the edge of the flange 13 and the inner flat side of the reel will engage the inner side of the plate 12, thereby applying the brake. When the collar 23 is moved in a clockwise direction (dotted lines, Figure 1), the axle 18 will be slid outwardly, thus displacing the reel 14 from the flange 13 and plate 12 and thereby releasing the reel for unwinding. A coiled spring 27 surrounds both the collar 23 and boss 22 and has one end secured to the former and its other end secured to the latter. The tension is exerted at all times to hold the reel outwardly from the flange 13 and shell 10 and it is obvious that normally the parts are out of braking position.

An operating lever 25 extends radially from the collar and has a laterally directed thumb piece 26 overhanging the flange 13. The arm is preferably made integral with the collar 23. When the lever 25 is depressed, co-acting stops 30 on the cams will limit the downward swing of the operating parts and the outward displacement of the reel. An ordinary metal tape line

A is coiled on the reel in the usual manner and has a sinker B attached to its lower end. The disk 15, near its outer periphery, is provided with a handle knob 35, by which said reel may be manually rotated.

Normally the parts are in the position shown in Figures 1 and 3, in which the reel is fully wound and the brake is applied, the arm 25 being swung upwardly by the spring 27. When it is desired to use the device, the operator grasps the handle 11 in his left hand and places his thumb upon the element 26 of the lever 25, as is shown in Figure 1. The device is held over the tank or container in which it is desired to measure the depth or level of the liquid. When the operator depresses the lever 25, the axle 18 will be rotated in a clockwise direction, as hereinafter explained, whereby the cams 23' will ride inwardly on the cams 22' and the reel 14 will be displaced from the plate 12 and flange 13 of the head, thus releasing the brake. The sinker B will then descend, pulling the tape A behind it and unwinding the reel. The lever is depressed only a sufficient distance to release the brake, as is shown in dotted lines in Figure 1.

When the sinker B reaches the bottom of the tank or container, or has descended to the desired point, the operator merely has to release the lever 25, whereby the spring 27, which has been extended, will rotate the axle 18 in a counter-clockwise direction, which will cause the cams 23' to ride outwardly on the cams 22', thereby applying the brake and instantly stopping the descent of the tape line and the unwinding of the reel. Then the slack in the tape line may instantly be taken up by lifting the device, but ordinarily this is not necessary, as the operator will feel the sinker strike the bottom of the tank and instantly release the lever.

The operator next grasps the knob 35 with his right hand and depresses the lever 25 to release the brake. He then proceeds to rotate the reel to wind the tape line A thereon. When the wet portion of the line appears, the measurement may be observed and noted. When the measurement has been noted and the tape wound upon the reel, the operator releases the lever 25 and removes his hand from the knob 35, whereby the brake is immediately applied.

While the device has been described as a measuring device, it is to be understood that it may be used in connection with line reeling devices.

What I claim and desire to secure by Letters Patent is:

1. In combination in a level gauging device, a support having a handle, a reel journaled on the support for carrying a measuring tape line and movable into braking engagement with the support, resilient means for yieldably pressing said reel in its engagement with the support, and means for positively moving said reel out of braking engagement with said support.

2. In combination in a level gauging device, a support having a handle, a reel journaled on

the support for carrying a measuring tape line and movable into braking engagement with the support, means for yieldably holding said reel in its braking engagement, hand operated lever and cam means for moving said reel out of braking engagement with said support, and means for manually winding the reel.

3. In combination in a level gauging device, a support having a handle, a reel journaled on said support for carrying a measuring tape and movable into and out of braking engagement with said support, means for manually moving said reel, spring means connected with said moving means for holding the reel in braking engagement with the support, and hand operated lever 15 and cam means for actuating said moving means in opposition to said spring means to move said reel out of braking engagement with the support.

4. In combination in a level gauging device, a circular head, a handle connected to said head, 20 a reel for carrying a tape line and movable into and out of braking engagement with said head, an axle on which said reel is journaled and movably mounted in the head, a lever connected to said axle, and cam means carried by the head 25 and said device for moving said axle to shift said reel upon the actuation of said lever.

5. In combination in a level gauging device, a circular head, a handle connected to said head, a reel for carrying a tape line and movable into 30 and out of braking engagement with said head, an axle on which said reel is journaled movably mounted in the head, a lever connected to said axle, means carried by the head and said lever for moving said axle to shift said reel upon the 35 actuation of said lever, and resilient means for moving said axle and normally holding the reel in braking engagement with the head.

6. In combination in a level gauging device, a circular head having a marginal flange, a 40 handle extending radially from the head, a reel for carrying a tape line journaled in the head and overlapping the flange for engagement therewith, an axle on which said reel is journaled, said axle being rotatably and slidably 45 mounted in the head, a cam carried by the head, a collar fastened on the axle and having a cam for engaging the cam of the head for sliding said axle upon rotation thereof, a lever connected with said collar and having a thumb piece 50 on its free end, and a coiled spring having one end connected with the casing and the other end connected with the collar for rotating said collar and bringing the reel into braking engagement with the head.

7. In combination, a support having a handle, a reel journaled on the support for carrying a line and movable into braking engagement with the support, resilient means for yieldably pressing said reel in its braking engagement with the 60 support and means for positively moving said reel out of braking engagement with said support.

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