Aug. 2, 1949. R. A. HANSON 2,477,927

LEVEL SENSITIVE SWITCH

Filed Feb. 4, 1948

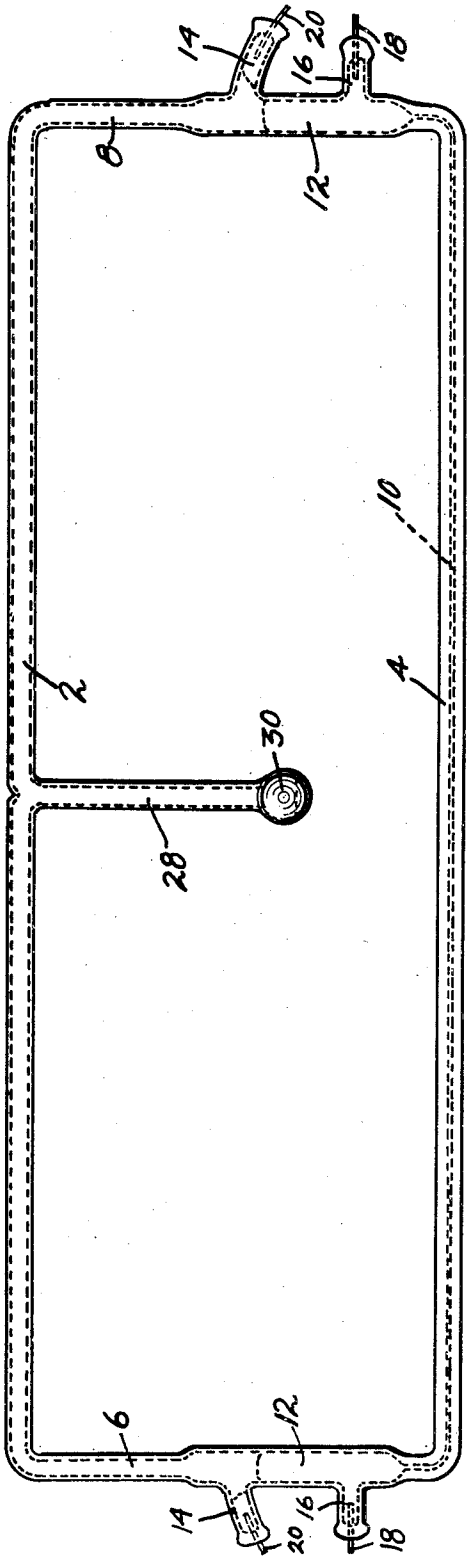


FIG. 1

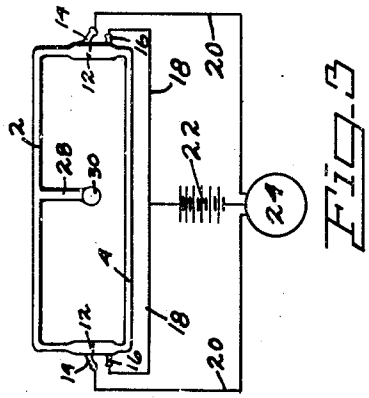


FIG. 3

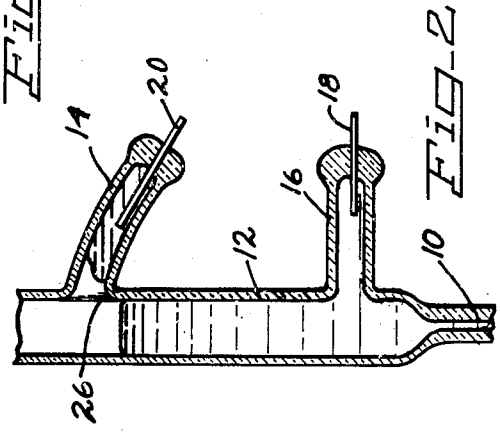


FIG. 2

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Patented Aug. 2, 1949

2,477,927

UNITED STATES PATENT OFFICE

2,477,927

LEVEL SENSITIVE SWITCH

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Application February 4, 1948, Serial No. 6,242

1 Claim. (Cl. 200—52)

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My present invention relates to an improved level sensitive switch especially adapted to control a level maintaining device.

It is one object of my invention to provide a self-contained level and switching unit which through making and breaking electrical circuits, controls the operation of a leveling device, as for threshing machines, and obviously may be employed in a multitude of purposes.

Another object of my invention is to provide a switch adapted to be secured to some integral part of the machine and the tilting of the machine will actuate the switch with no additional actuating mechanism.

Another object of my invention is to provide a switch in which the contact is made or broken through the meeting or separation of portions of conductive fluid, such as mercury, instead of the meeting or separating of the conductive fluid from wire, as is the usual arrangement.

Another object of my invention is to provide an endless tube in which the conductive fluid is contained and having metallic contact wires extending therein. This design allows the portion of the tube not containing conductive fluid to be formed with a vacuum, gas or air therein and will not restrict the operation of the switch. It also is a safety feature in that if the tube is broken in its upper portion, the switch will continue to operate in its normal way. If it is broken in its lower portion, the conductive fluid will be lost and the leveling device inoperative. But in the present arrangement, if a level control with the type switch now in use is broken, the switch is thrown one way or the other, causing the leveling device to operate to such an extent that a machine may be broken or overturned.

Another object of the invention is to form the endless tube with a storage reservoir in which the conductive fluid may be removed or deposited as appears necessary to adjust the degree of tilt required to make or break electrical contact.

Another object of the invention is to provide a restricted passage between one switching area and the other to limit the flow of the conductive fluid, thereby prohibiting any surge in its level.

In the drawings:

Fig. 1 is a front elevational view of the switch of my invention.

Fig. 2 is an enlarged vertical sectional view of one end.

Fig. 3 is a diagrammatic view showing the electrical circuit involved with the switch.

Referring now to the drawings I have illustrated the present preferred embodiment of my

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invention as comprising the tube having connected top and bottom portions 2 and 4 with connected ends 6 and 8.

The lower portion has a restricted passage 10 therethrough and the end portions have expanded reservoirs 12 from which extend the pocket extensions 14 and 16, the upper extensions 14 being inclined downwardly from the point of merging with the end portion. The closed ends of the extension each have contact wires 18 and 20 extending therethrough. The wires 18 lead to the positive side of a battery 22 which is negatively connected to motor 24 and the wires 20 complete the circuit.

Inasmuch as the conductive fluid contains a cohesive quality, the lag in breaking contact is sufficient to allow a leveling device to restore the machine to an exact level position before breaking contact. Once contact is broken the conductive fluid separates sufficient distance to be insensitive to shocks or jolts.

Normally, the conductive fluid in the tube is of sufficient quantity to fill the bottom tube, and the end tubes to a point just below the lip 26 of the upper extensions, also filling the lower extensions 16. A quantity of conductive fluid also partially fills the upper angular extensions 14, always immersing the end of wires 20. As the tube is tilted the conductive fluid in the reservoir 12 will pass over the lip, meeting the conductive fluid in one extension 14 thus closing the circuit through the conductive fluid column and wire 20. When the tube is tilted back to horizontal, the conductive fluid separates at the lip breaking the circuit. The restricted passage 10 will limit the flow of the conductive fluid thereby prohibiting any sudden urge and will prevent the column from rising above the level position.

Since the level of the conductive fluid within the tube is an important factor which designates the degree of tilt necessary to make the switch operate, I have provided an arm 28 connected with and depending from the upper tube 2 and having a bulb-like reservoir 30 into which the surplus fluid is deposited. If at any time the degree of operation should be changed, additional fluid from the tube may be deposited in the bulb or taken therefrom as appears necessary.

Having thus fully described my invention what I claim as new and desire to secure by Letters Patent is:

A level sensitive switch comprising an endless closed tube of rectangular shape and having elongated top and bottom portions and shorter side

portions, the bottom portion having a restricted passage therethrough, expanded reservoirs in the side portions, and spaced hollow extensions communicating with the interior of the reservoirs and the upper extension inclining downwardly from its connecting position, an arcuate lip between the reservoir and the upper extension, an electrical circuit including open wire ends extending into the hollow extensions, a column of conductive fluid in the tube, and a quantity of conductive fluid in the inclined extension whereby tilting of the switch will contact the conductive fluid column and the portion in the extension to close the circuit, and a fluid reservoir connected with and communicating with the interior of the upper tube portion to discharge or receive conductive fluid to vary the height of the column.

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