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Bachofer

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[54] **DRUM FILLING OVERFLOW CUT-OFF APPARATUS**

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[52] **U.S. Cl.** **141/227,** 141/96

[51] **Int. Cl.** **B65b 3/28,** B65b 57/04

[58] **Field of Search** 141/46, 95, 96, 115–127, 141/192–229; 166/53; 175/38

[56] **References Cited**

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[57] **ABSTRACT**

A drum filling overflow cut-off device for stopping the overflow in the filling of drums with a liquid fed thereto by a nozzle inserted in a fillhole in the drum. A splash collar position above the fillhole and moveable as a result of liquid splashing therefrom actuates a switch due to a change in position of the splash collar, the switch actuation resulting in termination of the flow into the drum.

4 Claims, 6 Drawing Figures

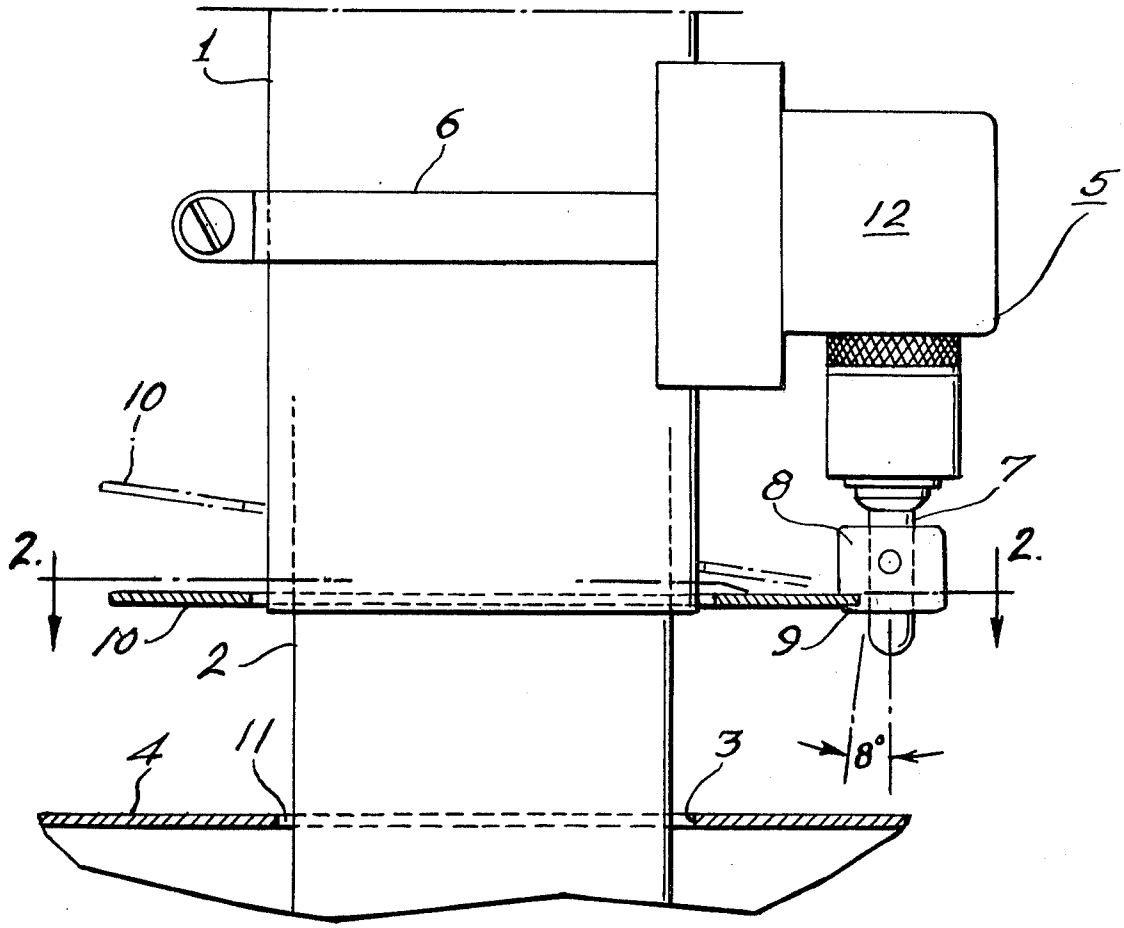


FIG. 1.

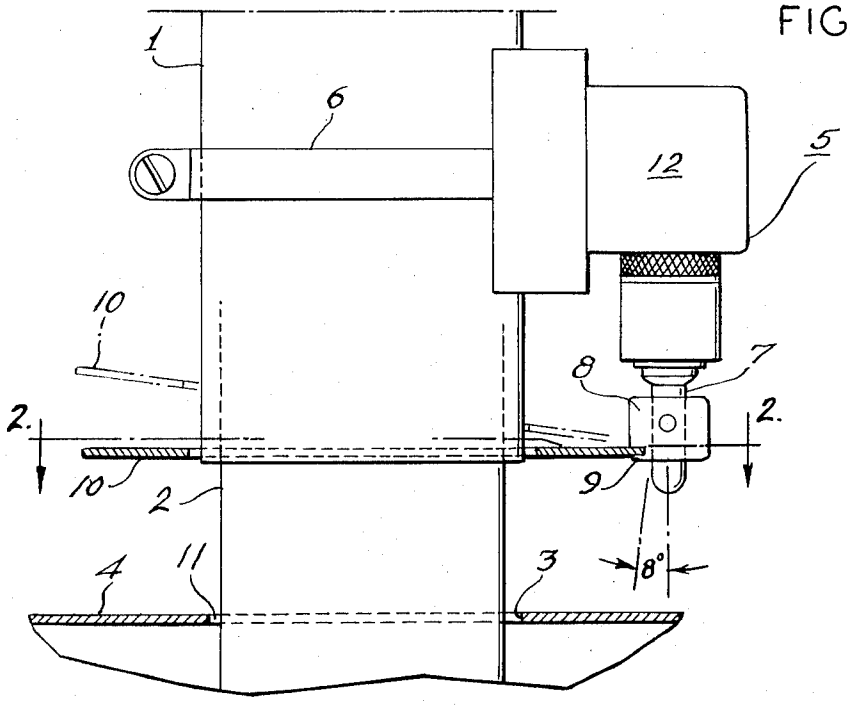


FIG. 2.

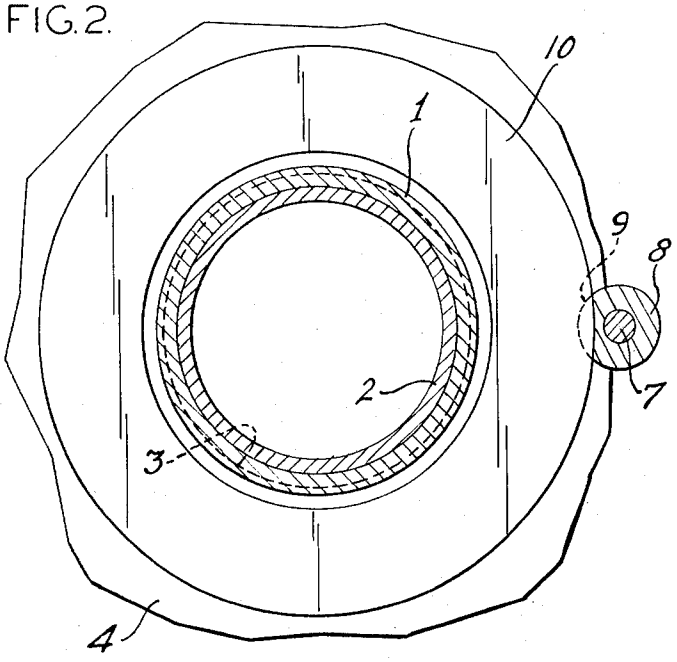
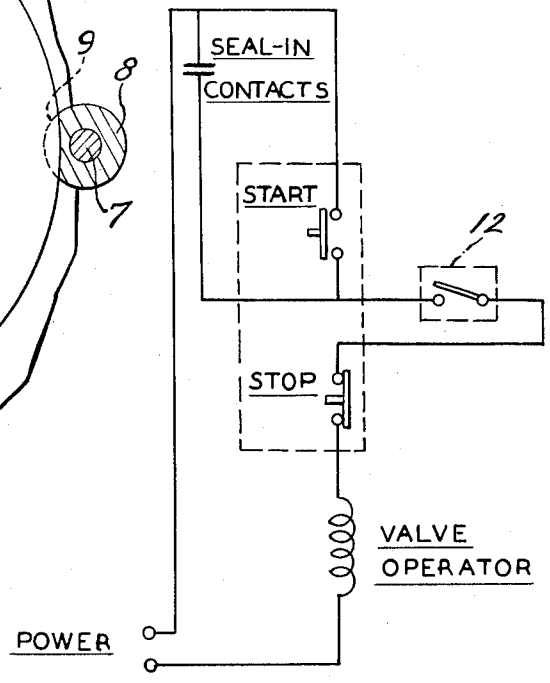


FIG. 3.



DRUM FILLING OVERFLOW CUT-OFF APPARATUS

BACKGROUND OF THE INVENTION

1. Field of the Invention

This invention relates to the control of drum filling apparatus wherein a nozzle is inserted in a fillhole in a drum. More particularly it relates to an emergency overflow cut-off control and actuated by movement of a splash collar due to the force of liquid overflowing the fillhole.

2. The Prior Art of the Invention

A drum filling procedure, such as is used to fill oil drums, usually consists of the following steps:

a. positioning a drum under a filling nozzle;

b. inserting a nozzle into the drum fill opening;

c. starting the filling procedure and filling the drum, usually by weight;

d. raising the nozzle clear of the drum;

e. removing the filled drum and delivering an empty drum and

f. installing a cap and cover on the filled drum, usually manually.

Often, when the operator fails to stop the filling procedure or when for various reasons a weight sensing device does not terminate filling, liquid is forced out of the drum around the fill nozzle and into the air in a heavy spray and the operator must reach through the spray to stop the filling procedure. If for some reason the operator is unable to stop the filling, this spilling will continue and result in expensive liquid loss, costly clean-up and costly down time.

The prior art fill control devices include use of floats, pressure sensors and diaphragms. A common feature of these types of fill control systems is that they stop the flow at a fixed volume or pressure within the drum or cask being filled. If, for some reason, the flow continues and sprays out of the drum, these interior sensing devices are of no aid to an operator who must reach through a spray or overflow to correct the problem. An exterior operating flow cut-off actuated by this spray would be most helpful as a sole fill control or as a back-up to any of the known fill control systems which are actuated by conditions inside the container being filled.

SUMMARY OF THE INVENTION

Such a safety cut-off device is now put forth to overcome the aforementioned drawbacks of present-day filling operations.

The present invention provides an apparatus for flow cut-off in case of overflow during a drum filling procedure wherein a filling nozzle is inserted in a drum fillhole comprising a moveable splash paddle positioned above the annulus defined by the outside circumference of the filling nozzle and the inside circumference of the drum fillhole and connected to a normally closed flow cut-off switch, which stops the filling procedure when opened and which is actuated to an open position by a change in position of the splash paddle resulting from overflowing liquid splashing out of the drum fillhole. The flow cut-off is accomplished by connecting the flow cut-off switch into the filling valve electrical circuit which breaks the circuit when actuated to an open position. The devices is especially useful in the filling of oil drums with petroleum liquids.

The advantages of such a system are that an existing filling apparatus can be easily adapted to contain this

safety feature, expensive spills and cleanup are avoided, possible operator injury is avoided and down time due to overflow is reduced.

These and other advantages will be more readily apparent upon review of the description of the drawings and the preferred embodiment which follows.

DESCRIPTION OF THE DRAWINGS AND THE PREFERRED EMBODIMENT

FIG. **1** is a schematic diagram showing the present invention mounted on a drum filling apparatus of conventional fixed-retractable fillpipe configuration.

FIG. **2** is a cross-sectional view at line **2—2** of FIG. **1** showing the splash paddle configuration.

FIG. **3** shows a fill circuit incorporation the cut-off switch of the present invention.

In FIG. **1** a fixed fillpipe **1** and a retractable fill-pipe **2** are shown in position to fill a drum through a drum fillhole **3** in the drum lid **4.** Mounted on the fixed fillpipe is the switch assembly **5.** A clamp **6** is shown but any conventional mounting will achieve the same results. The switch post **7** is shown in a vertical position. At this position the switch is closed. Attached to the switch post is the splash disc hub **8** which is in turn connected at swage-over **9** to the splash disc **10** which is positioned horizontally above the annular space **11** defined between the retractable fillpipe **2** and the fillhole **3.** When overflowing liquid passing through this annular space strikes the splash disc **10,** the latter moves away from its horizontal position thereby deflecting the switch post **7** and actuating the switch **12** to an open position. An actuation angle of **8°** is shown in this particular assembly but this can be varied by experimentation to accommodate the deflection expected in a given situation. The disc must be sufficiently rigid to actuate the switch when the disc is struck by liquid leaving the drum.

As shown in FIG. **2,** the disc surrounds the fixed fillipe so that splashing or spraying anywhere in the aperture **11** actuates the switch **12.** Either upward movement or pivotal movement around the switch post pivot point within the switch assembly will actuate the switch.

The circuit diagram in FIG. **3** shows the position of the switch **12** in the power filling circuit which breaks the circuit when open. The preferred switch is a random motion actuator type which opens due to upward or pivotal movement of the post or actuator.

This system is useful as a primary overflow control as well as a back-up to known fill control systems. Although a circular splash disc is preferred, any shape paddle positioned above the fillpipe and deflected by liquid overflow will achieve the advantages of the present invention.

The invention claimed is:

1. A device for controlling drum filling wherein a liquid is pumped into a drum through a nozzle inserted in a fillhole in the drum with an annular space defined between the nozzle and the fillhole comprising

a. a drum filling power circuit,

b. a disc positioned in a horizontal plane above the annular space and upwardly moveable in response to liquid leaving the drum through the annular space,

c. a vertically positioned and normally closed electrical toggle switch in the power circuit which breaks the circuit when in the open position which switch

is connected to the disc and is actuated to an open position by predetermined upward movement of the disc out of its previously horizontal plane position.

2. The device of claim **1** wherein the disc surrounds the nozzle above the annular space and is fixedly mounted to a disc hub attached to the switch, whereby upward movement of the disc is transmitted to the hub

actuating the switch to an open position.

3. The device of claim **1** wherein a movement of the disc which results in a movement of the switch of at least 8° from vertical results in actuation to an open position.

4. The device of claim **1** wherein the switch is a random motion actuator type.

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