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FLUID OVERFLOW SWITCH APPARATUS

Filed Sept. 26, 1962

FIG. 1

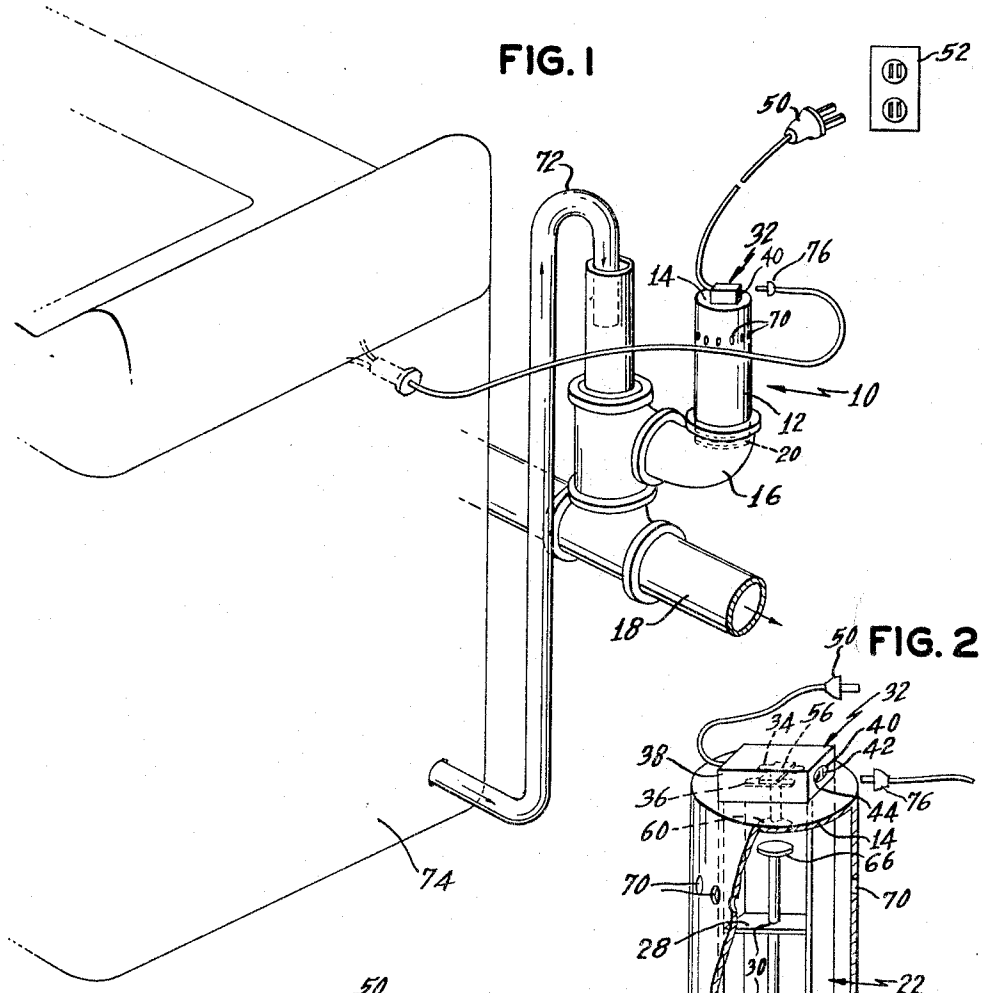
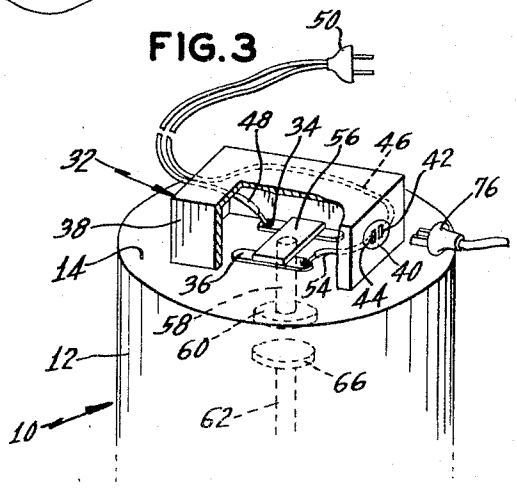


FIG. 2

FIG. 3



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FLUID OVERFLOW SWITCH APPARATUS

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This invention relates to a fluid overflow switch apparatus that is adapted to be included in a drain pipe or fluid exhaust line whereby when fluid in the drain pipe or line backs up for any reason, the backing fluid will cause the actuation of a switch to terminate the operation of mechanisms supplying fluid thereto.

In low-lying areas, especially those areas adjacent to lakes and along ocean shores, the tides sometime cause a back up of water through the drain pipe of a building thereby making it difficult to provide for proper drainage of waste fluids from the building. In practice, it has been found that the connection of an automatically operating washing machine to a drain pipe is too frequently left unobserved and unattended. In consequence, when, as a result of poor drainage conditions, fluid or water is caused to back up the drain pipe rather than to be exhausted or flow outward therefrom, the water added to the drain pipe from the automatically operating washing machine is usually sufficient to cause an overflow into the room, basement or area in which the washing machine is located, thus causing a condition of flooding unless the operation of the machine is terminated.

It is the desideratum of this invention to provide a fluid overflow switch apparatus that may be connected quickly and easily with very little modification to existing drain pipe structures. Further, to provide an apparatus whereby the electrical circuit to the washing machine will be connected and diverted through the instant apparatus; it being an object of the instant invention to terminate the operation of the washing machine and its exhaust of flooding waste fluid during a condition of overflow or back up of fluids in the drain pipe.

Another object of the invention resides in the provision of a safety feature whereby in the event of failure of operation of the instant invention, the fluid backing up in the drain pipe will be exhausted prior to the time that the same will have an opportunity to contact the electrical circuit and thereby prevent any possibility of shorting of such electrical circuit.

Other and further objects of this invention reside in the structures and arrangements hereinafter more fully described with reference to the accompanying drawing in which:

FIG. 1 is a diagrammatic view illustrating the fluid overflow switch apparatus mounted in a drain pipe according to the teaching of the invention,

FIG. 2 is an enlarged perspective view of the fluid overflow switch apparatus with portions thereof in cross section, and

FIG. 3 is an enlarged perspective cross section illustration of the details of the switch device.

Referring now to the drawing, the fluid overflow switch apparatus there shown is generally identified by the numeral **10** and comprises a casing **12** that is elongated in length including a substantially hollow interior and closed at one end, at the top **14** thereof. The casing **12** is illustrated in circular or tubular form for convenience in adapting the same to be mounted in a fitting **16** connected to the drain pipe or fluid exhaust line **18**. In order to secure the casing **12** to the fitting **16**, the same is provided with a series of threads **20** at the lower end thereof.

Mounted within the hollow of the casing **12** and fixedly connected to the inside of the top **14** thereof is a support or bracket structure generally identified by the numeral **22** and more clearly shown in FIG. 2. The support structure **22** is substantially U-shaped comprising a pair of spaced legs **24** that are connected together at their base member **26** and at their upper ends to the closing top **14** of the casing **12**. Thus, the structure **22** is suspendingly supported within the casing **12** and extends for a length of the casing. Intermediate the base **26** and the closing end **14** of the casing is a cross bar member **28**. The top end **14**, the cross bar member **28** and the base member **26** each is provided with an opening that is defined therewithin and identified by the numeral **30**. The openings **30** are in alignment with each other.

Mounted on the top end **14** is a switch device generally identified by the numeral **32**. The switch device **32** comprises a pair of spaced electrically conductive contacts **34** and **36** fixedly positioned within the housing **38**. Also mounted in the housing **38** is an electrical plug receptacle **40** that has a pair of plug contacts **42** and **44**. The plug contact **42** is connected to a conductor **46** while the switch contact **34** is connected to the conductor **48**. In practice, the conductors **46** and **48** terminate in an electrical outlet plug **50** that is adapted to be connected to any convenient source of electricity such as that provided at the normal household outlet **52**.

The remaining set of contacts **36** and **44** of the switch device **32** and the receptacle **40** respectively are electrically connected together by a conductor **54**. Positioned within the housing **38** and normally completing a circuit across the switch contacts **34** and **36** is a movable switch contact **56**. The movable switch contact **56** normally rests in engagement across the two contacts **34** and **36** to close the circuit therebetween. It may be retained in this position by spring means (not shown). However, the force of gravity is found sufficient to accomplish this function. The switch contact **56** is connected by means of a stem **58** to an enlarged operator **60**. Because the switch device **32** is mounted in the top end **14** of the casing **12**, the stem **58** extends downward and projects through the opening **30** provided in the end **14**. Thus, the enlarged operator **60** is suspended within the casing **12** below the closed end **14** thereof.

Positioned within the openings **30** of the cross bar member **28** and base **26** is a float shaft **62** that has a float **64** connected to the lower end thereof and an enlarged switch actuator **66** at the other end thereof. The openings **30** through which the shaft **62** extends serve to guide the movement of the shaft thereby insuring that the actuator end **66** thereof will cooperatively engage with the switch operator **60** that is normally spaced therefrom to lift the operator **60** and thereby disengage the switch contact **56** from its engagement with the contacts **34** and **36**. Beneath the float **64** and affixed to the casing **12** is a filter or strainer **68**. The casing is provided with exhaust means in the form of a plurality of openings **70** defined about the upper portion thereof. The openings **70** are spaced below the normally suspended position of the switch operator **60**.

When the fluid overflow switch apparatus **10** is utilized in the manner according to the teaching of the invention, it is threadingly engaged in the fitting **16** that forms a part of the drain pipe structure **18**. The adapter **16** so positions the casing **12** such that it is at a level substantially equal to or slightly below that of the connection of the fluid exhaust pipe **72** of a washing machine **74** to which the same is connected. Under normal conditions of operation, with the apparatus **10** secured in position in the fitting **16** and connected with the drain pipe **18**, the electrical plug **76** of the washing machine **74** is plugged into the receptacle **40** of the switch device **32**. If the plug **50** of the switch device is connected with the source of electricity such as at **52**, a flow of operating current is supplied to the washing machine and the same may be operated.

Normally the waste fluid is pumped from the washing

machine 74 through its drain or discharge hose 72 to the drain pipe 18 and from there, drained from the building. However, when surrounding water table levels are high and there is a backing up of fluids in the drain pipe 18, the continued addition of discharging washing machine water to the drain pipe will result in an overflow of the drain pipe and flooding. In order to eliminate this condition, without requiring the constant presence and attention of an operator, the apparatus 10 is connected in the fitting 16 in a substantially parallel relationship with that of the exhaust line 72 of the washing machine and either at a lower level than such exhaust line 72 or at a level substantially equal thereto.

Thus, when the waste fluids back up in the drain pipe 18, the same pass into the fitting 16 and upward into the casing 12 of the apparatus 10. The filter 68 in the base of the casing 12 will remove and filter out debris from the fluids entering the casing. As the fluids back up in the pipe 18, it rises in the casing 12 and causes the float 64 to rise because its stem 62 is guided in the support structure 22. In turn, the rising actuator end 66 closes the space and moves into engagement with the switch operator 60 thereabove lifting the same as the fluid rises in the casing to open the circuit between the switch contacts 34 and 36, thereby opening the circuit to the plug receptacle 40 and, in consequence, terminating the operation of the washing machine 74. When once the washing machine is stopped, it no longer pumps the waste fluid into the drain pipe 18 and thereby prevents the possibility of combining its waste fluid with the fluid backing up in the drain pipe 18 and prevents the possibility of flooding.

However, in the event of failure of the switch device 32 to operate in the manner described, it is necessary to permit the exhaust of the backing up fluid from the casing 12 prior to the time that the same will contact the switch operator 60 and possibly result in an electrical short circuit. For this reason, the casing 12 is provided with a plurality of exhaust means or openings 70 that are spaced below the height of the depending switch operator 60 to enable the exhaust of rising fluid from the casing 12 prior to the time the same has an opportunity to contact the operator 60.

It will be clear from the preceding disclosure that the present invention teaches the use of a simple fluid overflow switch apparatus that is able to be included in a fluid line to terminate the automatic operation of machines or other equipment feeding fluids thereto without requiring the constant presence of an operator or attendant upon the occurrence of backing up or flooding.

While there have been shown and described and pointed out the fundamental novel features of the invention as applied to a preferred embodiment thereof, it will be understood that various omissions and substitutions and changes

in the form and details of the device illustrated and in its operation may be made by those skilled in the art, without departing from the spirit of the invention. It is the intention, therefore, to be limited only as indicated by the scope of the claim appended hereto.

I claim:

In a fluid overflow switch apparatus for washing machines wherein the fluid exhaust of the washing machine is connected with a drain pipe, said apparatus comprising a casing adapted to be connected with a drain pipe at a level substantially equal to or lower than the connection of the fluid exhaust of a washing machine with the drain pipe, said casing being hollow and having a closed top, a substantially U-shaped support connected with said top and depending downward into said casing, said support including a cross member connected between the legs thereof and spaced between said top and base of said support, said top, cross member and base of said support each having aligned openings defined therein, a shaft movable in said openings of said cross member and base, said shaft having a float at one end thereof beneath said base and a switch actuator at the other end thereof, a switch device on said top and including normally closed contacts adapted to be connected with a source of electricity and with the washing machine to close an electrical circuit to the washing machine from said source, said switch device including contact means extending through said opening in said top and into said casing in alignment with but spaced from said switch actuator whereby when said float shaft is lifted in response to the rise of fluid in said casing, said switch actuator will be caused to move into engagement with said switch contact to actuate the same to open the electrical circuit to the washing machine to stop the exhaust of fluid therefrom, said plurality of switch contacts being two, each of which is relatively spaced from the other and said contact means normally engaging said switch contacts to close the same, a plug receptacle in said switch device having a pair of contacts, one of said switch contacts and one of said plug contacts having conductors adapted to be connected with a source of electricity, and a conductor electrically connecting the other one of said switch contacts with the other one of said plug contacts.

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