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SAFETY DEVICE FOR SWIMMING POOL PUMPS

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2 Sheets-Sheet 1

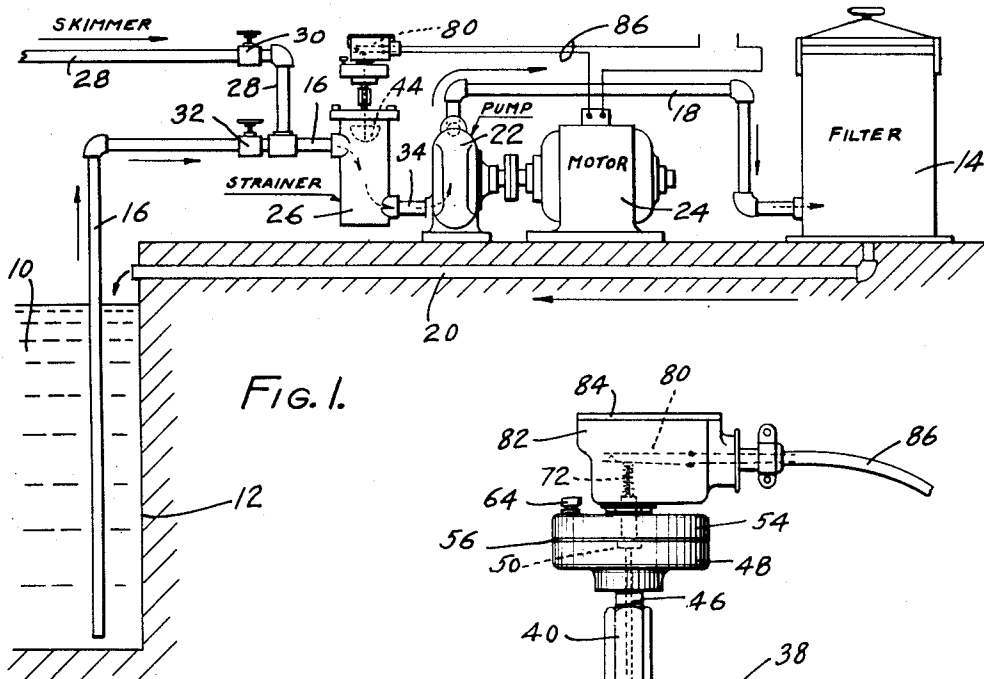


Fig. 1.

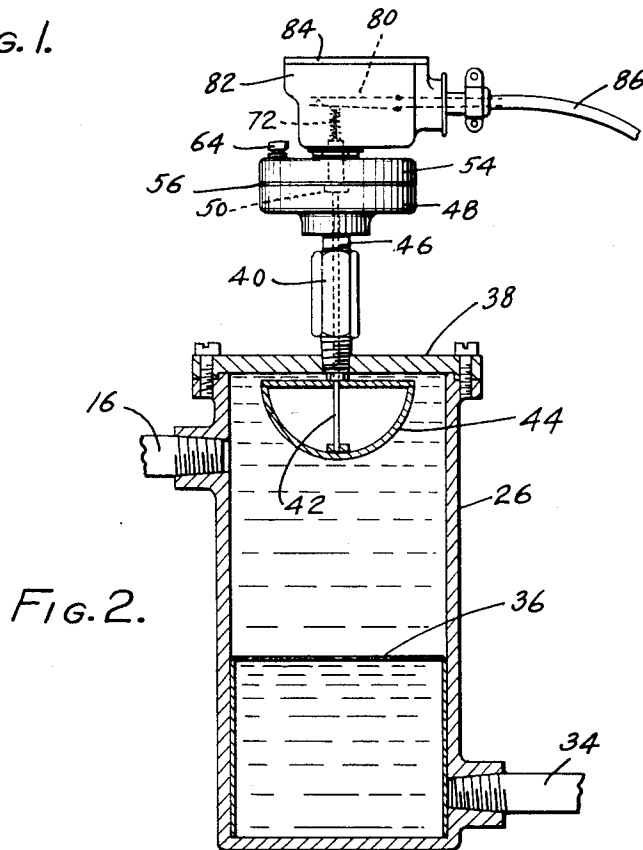


Fig. 2.

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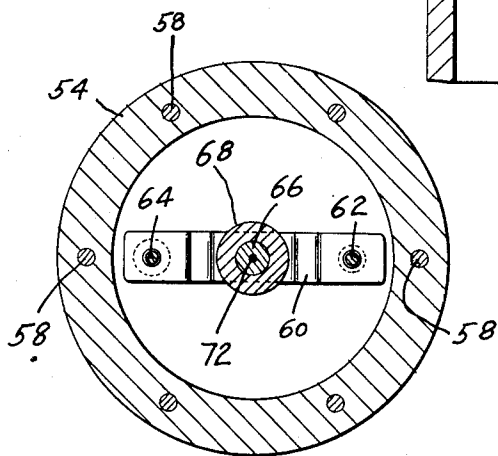
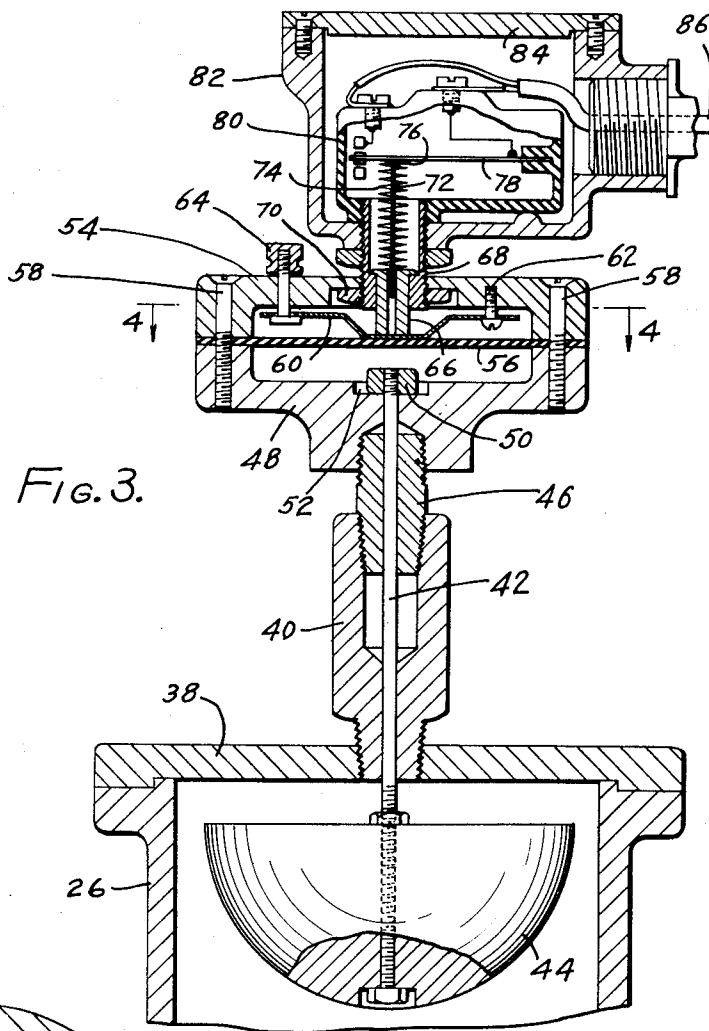
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SAFETY DEVICE FOR SWIMMING POOL PUMPS

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2 Claims. (Cl. 200—84)

This invention relates to an improved safety device for swimming pool pumps and has for one of its principal objects the provision of a device of the class described which will serve to automatically stop the operation of the motor driving the pump which supplies circulating water to a swimming pool and through the filter used in connection therewith, whenever the water level drops to a point where the pump loses its prime or suction.

In the usual swimming pool installation, the motor and pump combination will normally automatically circulate water through the filter, and there is usually a cylinder in the water line which contains a strainer for preventing leaves and other debris from contaminating or jamming the pump or the filter. This strainer housing is adjacent the pump and is normally full of water, affording a proper supply of water to the pump so that it will always be primed for immediate action when the motor is started.

However, if, for any reason, such as evaporation or the like, the water level drops to a degree where the pump loses its prime with the motor running, the motor will continue to run, even though no water is being circulated, and this condition will prevail until such time as the water in the pool is replenished and brought to its normal level or until someone notices the condition and manually shuts off the supply of current.

It is well known that any motor or pump which continues to run at a normal speed for any great length of time will wear out faster than pumps which do not run continuously or unnecessarily.

Therefore, it is one of the important objects of this invention to automatically stop the operation of a swimming pool motor and pump combination whenever, due to low water or some other circumstance, proper pumping will not result.

Another and further important object of the invention is the provision of such an automatic safety device which will be simple of construction, positive in operation and easily installed in practically any swimming pool equipment and with a minimum expenditure of time and labor.

Yet another important object is the provision of a safety switch for equipment of this type which will eliminate the necessity of periodical inspections of the water level and the related equipment in order to avoid unnecessary wear and tear on the motor and pump.

Another and still further important object of the invention is to automatically prevent the further running of the motor and pump of swimming pool equipment, thereby preventing impairment of the efficiency of this portion of the equipment and also saving expensive repair bills.

Other and further important objects of the invention will be apparent from the disclosures in the accompanying drawings and following specification.

The invention, in a preferred form, is illustrated in the drawings and hereinafter more fully described.

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In the drawings:

Figure 1 is an elevational view, somewhat diagrammatic, illustrating the safety device mounted upon a representative swimming pool pump and motor combination.

Figure 2 is an enlarged view, partly in section, showing the strainer casing of the swimming pool water circulating line with the safety device of this invention installed therein.

Figure 3 is a further enlarged view of the actual diaphragm, switch and float combination which comprises the essence of this invention.

Figure 4 is a view, partly in section, taken on the plane of the line 4—4 of Figure 3, looking in the direction indicated by the arrows.

As shown in the drawings:

The reference numeral 10 indicates generally a body of water in a swimming pool 12 or the like; the pool being equipped with the usual filter 14; pipe lines 16, 18 and 20 which combine with a pump 22, and an operating motor 24 will serve to pull water out of the pool 12 adjacent its bottom through a strainer container 26 and thence through the filter and back to the pool.

Another line 28 supplying skimmer water is provided, this line having a valve 30 therein for controlling the input. A similar valve 32 is in the line 16 leading to the strainer cylinder 26, and the strainer cylinder is connected to the pump by a short pipe 34.

Referring now to Figure 2, it will be noted that the cylinder or housing 26 has a strainer element 36 therein and is normally full of water so as to afford an initial priming supply of liquid to the pump 22 whenever it is started. It will also be evident that if the water level in the container 26, for one reason or another, drops to a point where the pump cannot be primed, the motor and pump, if once started, will continue to run with no effect on the circulation or filtering operation. This is needless and will soon cause damage to both pieces of equipment.

It will further be noted that the strainer container 26 is provided with a removable cover 38 which provides a clean-out and refill means whenever such becomes necessary and the safety switch operating device of this invention can be very conveniently installed at this point.

As best shown in Figure 3, an opening is first made in the cover 38 and tapped to receive a screw-threaded plug 40 hexagonal in cross section, as best shown in Figure 2, and this is hollow, thereby providing for the slidable reception of a stem or rod 42.

A float 44 of some material having a specific gravity lower than that of water is fixed to the end of the stem 42 in any convenient manner and may comprise some light plastic material formed in any convenient shape or may be hollow.

The rod or stem 42 is fitted through a second plug 46 which is screw threaded at each end, as best shown in Figure 3, and the lower part 48 of a housing is mounted on the upper end of the plug 46. A button or the like 50 is affixed to the upper end of the rod or stem 42 and seats in a recess 52 in the inner face of the housing portion 48.

A juxtaposed housing element 54 surmounts and is fastened to the lower housing element 48, both being hollow, as shown, and a diaphragm 56 is fastened in position between the conjoined faces of the two housing portions 48 and 54, the assembly being completed by means for machine screws or the like 58.

A leaf spring or the like 60 is positioned above the diaphragm 56 by means of a bolt or the like 62, and the free end of this spring is connected to a pull 64 which extends through an opening in the casing 54, rendering manual operation of the spring and its connections feasible.

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The spring and diaphragm combination contacts the lower end of a hollow plug 66, which is movable in an externally screw-threaded cylinder 68 also mounted in a central opening in the top of the casing 54 and adjustably maintained in position therein by means of a locking nut 70. The plug supports a stem 72 surrounded by a helical spring 74, and the upper end of the stem is provided with a small head 76 which contacts the leaf spring 78 of a micro switch or the like 80. This micro switch is mounted in a housing 82, having a cover 84, and includes current-carrying wires 86 which lead to the motor 24.

So long as the strainer casing 26 is filled with water, the pump 22, when set into motion, will effectively force water 10 out of the pool 12 through the pipes 16 and 18 to the filter 14 and back to the pool, via pipe 20.

By manipulating valves 30 and 32, additional water can be brought into the pool, either by way of the pump or directly through the pipe 16 if sufficient pressure is available.

However, if the level of the water in the strainer casing 26 drops to the point where the pump would run dry and would not serve its purpose, the float 44 will drop and, acting through the diaphragm 56, spring 69 and pin 72, will, by way of the micro switch 80, shut off the flow of current to the motor 24, whereupon all operation will cease and unnecessary and expensive continuous running of the pump and motor will be automatically eliminated.

It will be evident that herein is provided a simple, relatively inexpensive automatic control or shut off for swimming pool pump motors which will save a great deal of worry, trouble, annoyance, and actual repair bills because of its automatic operation, once installed.

Obviously, the device can be used in conjunction with practically any type of swimming pool equipment now on the market with little or no variation from a standard assembly such as herein disclosed and described. Further, installation is simple and can be accomplished in a very short space of time with a minimum of trouble and labor, and the same or similar type of equipment can be used for automatic control of pumps and motors in many other environments wherever a similar situation involving an automatic shut off to prevent unnecessary operation of a motor or pump is deemed necessary.

It will be noted that there is absolutely no possibility of water getting into the switch housing 82 or even the upper part 54 of the diaphragm and spring housing. The diaphragm 56 seals off the lower part of this hous-

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ing so that even if water did accidentally enter the lower part of the housing, it could penetrate no further, and danger of accidental short circuiting or damage to the switch is positively eliminated.

I am aware that many changes may be made and numerous details of construction varied throughout a wide range without departing from the principles of this invention; and I, therefore, do not propose limiting the patent granted hereon otherwise than as necessitated by the prior art.

I claim as my invention:

1. An automatic shut off for pump motors comprising a float in a body of circulating liquid, a stem supporting the float, a switch adjacent the other end of the stem, current-carrying means between the switch and the pump motor, a liquid seal-off diaphragm positioned between the stem and the switch, an emergency manual control positioned between the stem and the switch, said liquid seal-off diaphragm being adjacent the manual control, a spring-impelled rod connecting the diaphragm and manual control at one end and the switch at the other end, a container for part of the liquid and a support for the stem and switch mounted in the top of the container.

2. A safety switch for swimming pool pump motors, comprising a container for circulating liquid, inlet and outlet pipes for the container, a closure at the top of the container, a float in the container, a stem for supporting the float, said stem projecting through an opening in the container, stem positioning means in the opening, said stem positioning means including a cylindrical housing, a diaphragm horizontally fixed in the housing dividing the same into two parts, the end of the stem terminating in the lower part of the housing, a current-carrying switch positioned above the diaphragm housing, resilient means adjustably fixed in the upper portion of the diaphragm housing in operative contact with the diaphragm and a spring impelled stem connecting said resilient means to the current-carrying switch, whereby said switch is operated by the presence of a predetermined liquid level in the container.

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