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RAIN ACTUATED MEANS FOR OPERATING LAWN SPRINKLER SYSTEMS

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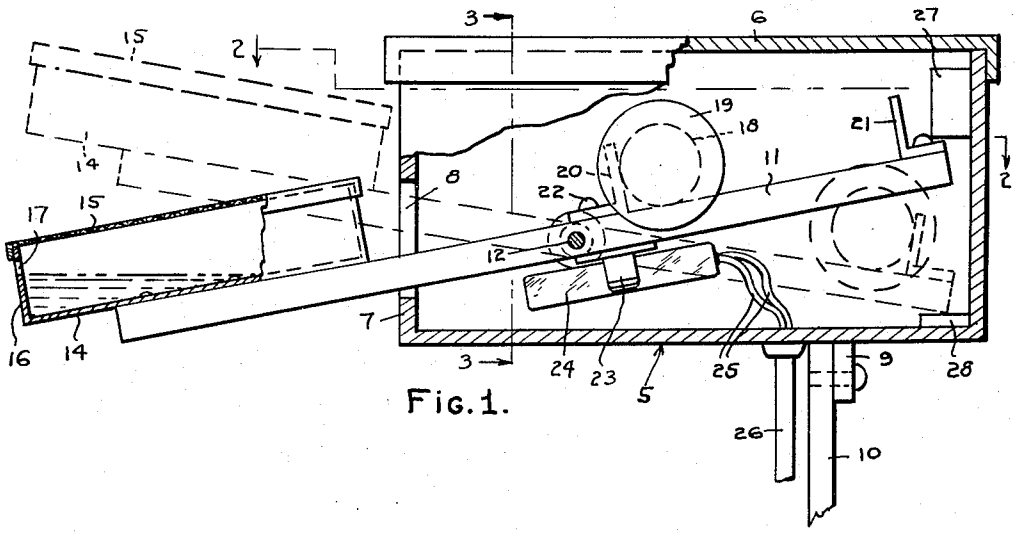


Fig. 1.

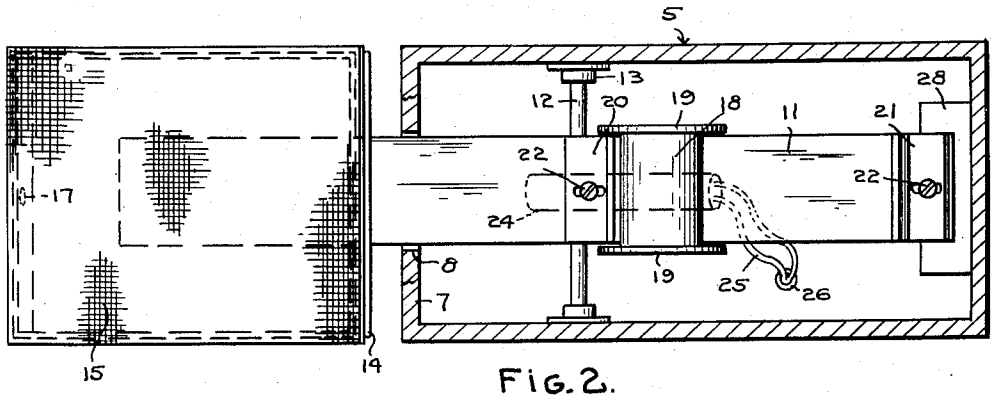


Fig. 2.

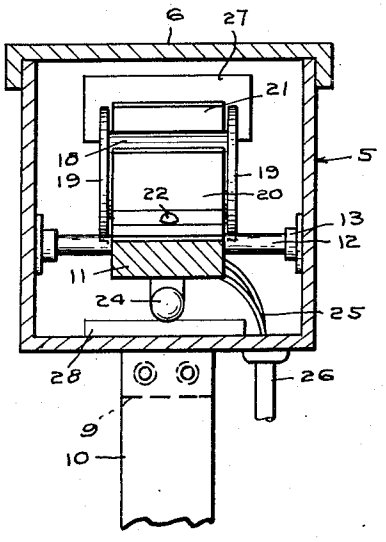


Fig. 3.

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RAIN ACTUATED MEANS FOR OPERATING LAWN SPRINKLER SYSTEMS

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1 Claim. (Cl. 200—85)

This invention relates to a rain responsive circuit closure device that is primarily employed to actuate a sprinkler system for lawns, gardens, orchards and the like and whereby the device serves to actuate electrical control means embodied within conventional sprinkler systems, either for controlling valve mechanisms normally employed where the sprinkler system is connected to a city water supply or for actuating an electrically driven pump where the sprinkler system is connected to a well or other water supply.

The invention contemplates a balanced mechanism that is provided with a water accumulating pan that is disposed in a position for receiving rain water and that normally balances the mechanism to a circuit interrupting position in the presence of rain and that will be overbalanced by mechanism in the absence of rain for a predetermined period whereby the mechanism is overbalanced in an opposite direction to complete an electrical circuit to the control mechanism for the sprinkler system.

The device embodies a novel form of rocker arm having the water receptacle at the outer end thereof and with the rocker arm having disposed thereon a roller device that is weighted in a manner to overbalance the water receptacle in the absence of rain and whereby the roller device will shift to overbalance the rocker arm to establish the electrical circuit.

Novel features of construction and operation of the device will be more clearly apparent during the course of the following description, reference being had to the accompanying drawings wherein has been illustrated a preferred form of the device and wherein like characters of reference are employed to denote like parts throughout the several figures.

In the drawings:

Figure 1 is a longitudinal section through the device, parts being shown in elevation and with the parts being illustrated in full lines in one inoperative position and in dotted lines in an operative position,

Figure 2 is a horizontal section taken substantially on line 2—2 of Figure 1 and,

Figure 3 is a transverse vertical section taken substantially on line 3—3 of Figure 1.

Referring specifically to the drawings, the numeral 5 designates a housing as a whole, formed of metal or any other desirable material. The housing is generally rectangular and is open at its upper side. A cover 6 is disposed over the upper side of the housing for protection of the enclosed elements, against rain or other foreign matter. One end of the housing indicated at 7 is provided with an opening 8. The housing 5 is supported in any desirable position by a flange 9 that is rigidly attached to a supporting member 10, such as a bracket or other device whereby the housing may be arranged in a position where it will be subjected to falling rain. The housing may be disposed upon a roof of an adjacent building or it may be supported upon a stake or the like at a proper elevation where it will be free from unauthorized contact.

Mounted within the housing 5 is a rocker arm 11. The rocker arm is generally rectangular in cross-section. The rocker arm is supported upon a cross-shaft 12 that is journalled at its opposite end in any desirable bearings 13 in a manner whereby the arm 11 may rock in a vertical plane. The rocker arm 11 extends forwardly through the opening 8 to project outwardly of the housing for the fixed support of a pan 14. The pan 14 is of predetermined dimensions and is formed open at its top. The upper side is closed by a foraminous cover 15, such as screen wire or the like and whereby to prevent the entry of trash or other elements within the pan that would normally interfere with the balancing effect of rain water entering the pan. The forward wall 16 of the pan is provided with an overflow aperture 17 that is positioned at a predetermined point to govern the amount of water permitted to collect therein.

Shiftably disposed upon the rocker arm 11 at a point rearwardly of the shaft 12, is a roller 18 having flanged ends 19 that engage the opposite edges of the arm 11. The path of rolling action of the roller 18 upon the upper surface of the arm 11 is determined by L-shaped stops 20 and 21 that are adjustably connected upon the surface of the arm 11 by screws 22. The stops 20 and 21 may be adjusted in accordance with the desired balancing action of the roller with respect to the pan 14 and whereby to very accurately control the actuation of the device in accordance with the desired period of actuation.

Mounted upon the underside of the arm 11, as by any suitable clip device 23, is a conventional mercury switch 24. Leading from one end of the switch 24 are a pair of conductors 25, that are trained downwardly through a conduit 26 to the element or elements to be controlled by the device. The conductors 25 are sufficiently long as to permit of the free swinging movement of the arm 11. Fixed upon a rear wall of the housing 5 is an upper stop 27 that limits the swinging movement of the arm to a circuit interrupting position, while a lower stop or pad 28 is engaged by the arm 11 and that limits the movement of the arm 11 to an operative or circuit closing position.

In the use of the device, when there is an absence of rain, the roller 18 will overbalance the pan 14, causing the inner end of the arm 11 to swing downwardly at a predetermined position of swinging movement, the roller 18 will roll downwardly against the stop 21, causing the mercury within the switch 24 to close the circuit through the conductors 25 and actuating the mechanism that controls the sprinkler system. It will be apparent of course that mechanism within the sprinkler system will determine just how long the sprinkler system will actuate and will automatically interrupt the flow of water in accordance with the setting of the time interval for the sprinklers. Normally, if there is no rain, the automatic valve mechanism or a timer device in the sprinkler system will periodically actuate the system and such systems have heretofore been employed having time clocks or the like to determine the period of operation and the device of this invention is primarily concerned with circuit interrupting means whereby the circuit to the time clock and other elements embodied within the sprinkler system may be effectively controlled. Now, when it begins to rain, rain water will collect in the pan 14 and when a sufficient volume of water has been collected therein, such volume being recognized as sufficient to water the surrounding area, the rocker arm will be overbalanced by the weight of the water, swinging the arm in a reverse direction and causing the roller 18 to roll forwardly to engage the stop 20. A continuous rain will overflow through the aperture 17, so that at no time can there be collected more than a predetermined volume of water within the pan. If the rain is insufficient to create enough volume to over-

balance the weight of the roller **18**, then the roller will remain against the stop **21**, maintaining the circuit in a closed condition. When sufficient water has evaporated from the pan **14**, the weight of the roller **18** will again overbalance the pan **14**, swinging the arm **11** downwardly to again establish a circuit to the control mechanisms of the sprinkler system. The position of the aperture **17** definitely establishes the volume of water that may be collected in the pan, such volume being capable of balancing the arm **11** to a circuit interrupting position, and the circuit interrupting position of the arm **11** will remain in overbalanced relation until all of the water has evaporated from the pan **14** and, the time of evaporation will obviously depend upon the atmospheric condition, such as the humidity count. Obviously, where the humidity is high, there will be relatively little water absorption from the ground and, when the humidity is low, the water in the pan evaporates much more rapidly and for the same reason, the absorption of the water from the ground is much more rapid hence, the device is only operable when there is an actual need for the sprinkler system to be placed in operation.

It will be apparent from the foregoing that there has been provided a novel arrangement of balance arm **11** having the roller **18** disposed in a position with respect to the shaft **12** whereby the device is actuated to and from a circuit closing position in accordance with the degree of rainfall and the rate of evaporation of water in the pan. The mechanism within the housing **5** is protected against the elements while the pan **14** is protected by the cover **15** against the collection of trash or other elements that would interfere with the accurate operation of the device. The parts are few and simple, are strong, durable, require no attention, are cheap to manufacture and are accurate to a relatively high degree.

It is to be understood that the invention is not limited to the precise arrangement shown, but that changes are contemplated as readily fall within the spirit of the invention as shall be determined by the scope of the subjoined claim.

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

A rain actuated circuit closer for actuating a sprinkler system, comprising a housing and a support therefor, a rocker arm pivotally disposed in the housing to rock in a vertical plane, one end of the arm projecting beyond the housing, an open receptacle carried upon the extended end of the arm and disposed in a manner to receive and accumulate rainwater, the said receptacle constituting balance means when water is accumulated therein, a shiftable weight disposed upon the arm portion within the housing, means for limiting the shifting movement of the weight, a circuit closer carried by the arm and that serves to establish and interrupt a flow of current to the sprinkler system, the said receptacle when filled to a predetermined level with rainwater serving to overbalance the weight for rocking the arm to a position where the circuit closer interrupts the flow of current to the sprinkler system, the last named movement of the arm causing the weight to shift to a point adjacent the pivotal means, the said weight overbalancing the receptacle when a predetermined amount of water has evaporated to cause the arm to swing in a reverse direction to actuate the circuit closer to again establish a flow of current to the sprinkler system, the said weight being simultaneously shifted to a greater overbalancing position to maintain the sprinkler system energized until the receptacle has again accumulated the predetermined body of water, the said weight comprises a roller having flanged ends that overlie the edges of the arm, the said roller partaking of a rolling action upon the surface of the arm to and from an overbalancing relation to the receptacle, adjustable stops carried by the arm and whereby to limit the rolling action of the roller and stop means in the housing that are engaged by the inner end of the arm for limiting its vertical swinging movement.

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