Oct. 18, 1927. 1,645,763

G. E. LUNDBERG ET AL

AUTOMATIC TIMING VALVE

Filed March 12, 1926

Fig. 1

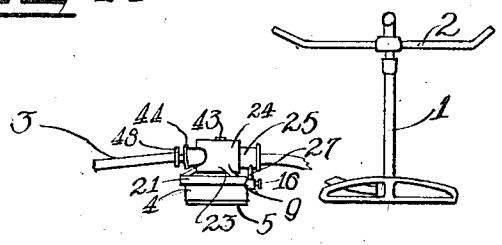


Fig. 2

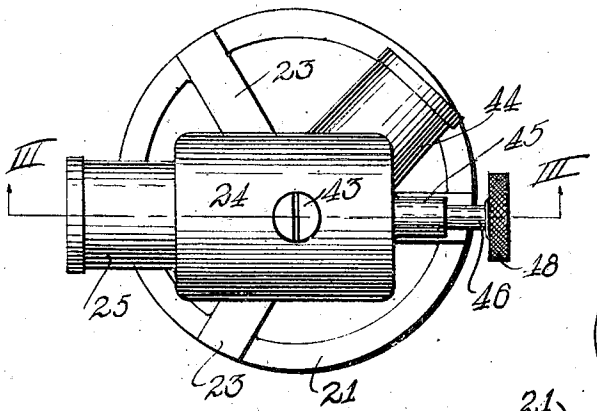


Fig. 4

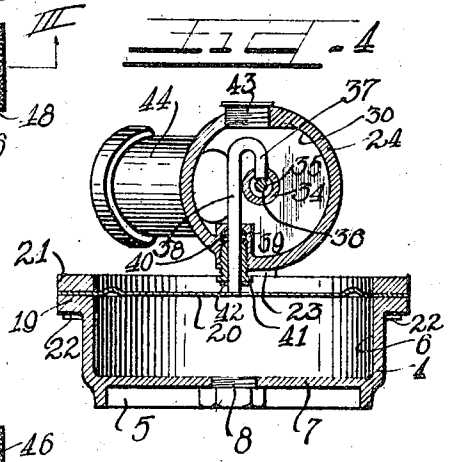
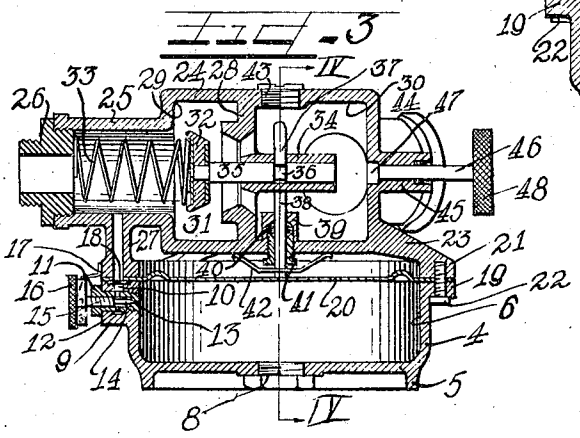


Fig. 3



Inventors

Gunnar E. Lundberg

Ivar Jeppsson

By Charles Gilbert Attys

Patented Oct. 18, 1927. 1,645,763

UNITED STATES PATENT OFFICE.

GUNNAR E. LUNDBERG AND IVAR JEPPSSON, OF CHICAGO, ILLINOIS.

AUTOMATIC TIMING VALVE.

Application filed March 12, 1926. Serial No. 94,134.

When sprinkling lawns by means of automatic sprinklers the sprinkler is very often set in a desired position to sprinkle a selected area. It frequently happens that the sprinkler is forgotten, or no trace has been kept of the length of time that the sprinkler has been in operation in a predetermined location. It also happens quite frequently that the sprinkler is left in operation over night thereby not only causing an extravagant waste of water but resulting in the flooding of the area while other portions of the lawn are practically dry.

In order to obviate the above difficulties, this invention has been devised for the purpose of providing an improved automatic timing valve adapted to be used in a sprinkler hose between the supply faucet and the automatic sprinkler for the purpose of permitting the sprinkler to operate for a predetermined time and then automatically shut off.

It is an object of this invention to provide an automatic timing valve for automatic lawn sprinklers.

It is also an object of this invention to provide an automatic timing valve in a sprinkling or water supply hose.

It is a further object of this invention to provide a valve for use in connection with water supply hoses and sprinklers, said valve adapted to be adjusted so that the same will automatically close to shut off the supply of water after a predetermined elapse of time.

It is an important object of this invention to provide an improved pressure control valve, adapted to be set to permit liquid to flow therethrough for a predetermined length of time after which the valve is automatically released and closed to shut off the flow of liquid therethrough.

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

This invention (in a preferred form) is illustrated in the drawings and hereinafter more fully described.

On the drawings:

Figure 1 is a side elevation of an automatic rotatable type of lawn sprinkler and a fragmentary portion of a water sprinkling hose connected therewith, said hose having connected therein an automatic timing valve embodying the principles of this invention.

Figure 2 is an enlarged top plan view of the automatic timing valve.

Figure 3 is a vertical longitudinal section of the valve taken on line III—III of Figure 2 with parts shown in elevation.

Figure 4 is a transverse vertical section taken on line IV—IV of Figure 3 with parts in elevation.

As shown on the drawings:

The reference numeral 1 indicates an automatic sprinkler stand having rotatably mounted on the top thereof a spray wheel 2 of any desired construction. Connected to the base of the automatic sprinkler stand is one end of a water hose 3 the other end of which is adapted to be connected with any suitable source of water supply. Connected in the hose 3 between the source of water supply and the automatic water sprinkler is an automatic timing valve embodying the principles of this invention.

The timing valve comprises a base 4 provided with a supporting flange 5 or other suitable means, said base 4 having a pressure chamber 6 therein. Provided in the central portion of the bottom 7 of the base is a threaded opening adapted to removably receive a threaded plug 8. Integrally formed on one side of the base 4 is a projection or valve housing 9 provided with a vertical passage 10 and with a horizontal passage in which a thimble or valve sleeve 11 is engaged. The valve sleeve is provided with a diametrical passage 12 communicating with the passage 10. The inner end of the valve sleeve 11 is threaded into position and provided with a valve seat 13 in which a needle valve 14 is adapted to seat. The needle valve 14 is connected with a threaded valve stem 15 having a knurled head 16 engaged on the outer end thereof. The head 16 is provided with a plain rim portion on which is applied a graduated scale to facilitate adjustment of the needle valve 14. A finger or pointer 17 is provided with which the graduated scale on the head 16 is adapted to co-act in making adjustments of the needle valve. Seated in the upper portion of the

valve housing 9 in the upper end of the passage 10 is a strainer or screen 18 to prevent dirt from coming into contact with the needle valve. Mounted upon the flange 19 of the base 4 is a flexible diaphragm 20 which closes the upper end of the compression chamber 6.

Seated upon the margin of the diaphragm 20 is a ring 21 held in place by means of retaining screws 22 or other suitable means. Integrally connected with the ring 21 are a plurality of radially directed arms or legs 23 which support a cylindrical valve casing or housing 24. Integrally connected with one end of the valve casing 24 is an inlet pipe or arm 25, the outer portion of the inner periphery of which is threaded to receive one end of a hose coupling 26. Connecting the inlet pipe 25 with the supporting ring 21 is a vertical by-pass pipe or tube 27 having a passage therethrough the lower end of which communicates with the strainer or screen 18 while the upper end of the tube passage communicates with the interior of the intake pipe 25 .

The valve casing 24 is provided with a transverse partition 28 which divides the interior of the valve casing 24 into an intake chamber 29 and an outlet chamber 30. The partition 28 is formed with a valve seat 31 which projects into the intake chamber 29 and is adapted to receive a main control or shut off valve 32. Mounted in the intake pipe 25 is a spiral control spring 33 the outer end of which fits against the hose coupling 26 while the inner end of said spring seats within a recess in the main valve 32, as clearly illustrated in Figure 3. Connected axially with the partition 28 is a guide sleeve 34 which projects into the valve chamber 30 and affords a guide for a valve stem 35 which supports the main valve 32. The valve stem 35 is provided with a peripheral groove 36 to removably receive the upper hooked end 37 of a locking rod 38. The hook member 37 slidably projects into a guide opening in the sleeve 34. The lower end of the locking rod 38 projects axially downward through a projection 39 formed within the chamber 30 of the valve casing 24. The projection 39 is recessed to receive a packing 40 which is held in place by means of a threaded sleeve 41. The lower end of the hooked rod 38 projects through the packing 40 and the sleeve 41 and contacts the upper surface of the diaphragm 20. Engaged on the lower end of the hooked rod 38 between the diaphragm 20 and the sleeve 41 is a control spring 42 adapted to normally hold the hook 37 in its lower rocked position as indicated in Figures 3 and 4. When the hook 37 is in its locked position engaged in the groove 36 of the valve stem 35, the main control valve is held in its open position as shown in Figure 3. The upper portion of the valve casing 24 is provided with a threaded opening communicating with the chamber 30, said opening having a threaded screw plug 43 removably engaged therein.

Integrally formed at an angle on one side of valve casing 24 and communicating with the outlet chamber 30 is a discharge or outlet elbow or pipe 44 to which is connected one end of the hose section 3 which is positioned between the automatic sprinkler and the automatic timing valve.

Integrally formed on one end of the casing 24 opposite the pipe 25 is a guide sleeve 45 in which a plunger rod 46 is slidably mounted. A plunger head 47 is formed on the inner end of the plunger rod 46 for coaction with one end of the valve stem 35. When it is desired to move the main control valve 32 from a closed into an open position, a knurled head 48 formed on the outer projecting end of the plunger rod 46 is actuated to bring the plunger head 47 into contact with the valve stem 35.

The operation is as follows:

As illustrated in Figure 1 the improved automatic timing valve is connected in the water supply hose 3 between the point of supply and the automatic sprinkler 1—2. The automatic sprinkler is set in a desired location upon a lawn so that the selected area may be properly sprinkled. The duration of sprinkling may be timed by means of the improved automatic timing valve, the period of operation depending upon the adjustment of the needle valve 14. To adjust the device the needle valve head 16 is rotated into an adjusted position which may be readily secured by setting the graduated rim portion of the head in a predetermined position with respect to the indicator or pointer 17. This adjustment of the needle valve head sets the needle valve 14.

The main control valve 32 is normally set in an open position by pushing the plunger rod 46 inwardly thereby causing the plunger head 47 to contact one end of the valve stem 35 to slide said valve stem in the guide sleeve 34 until the groove 36 of the valve stem is brought into a position to register with the locking hook 37. When this position of adjustment is reached the spring 42 acts to automatically pull the locking hook 37 inwardly into the groove 36 thereby holding the valve 32 in the open position, illustrated in Figure 3, against the action of the coil spring 33 which is of course compressed.

When the needle valve 14 is set in a desired position of adjustment to permit the sprinkler to operate for a predetermined time, the supply of water to the pipe 3 is turned on thereby permitting the water to flow from the hose 3 through the coupling 26 and into the inlet pipe 25. From the

pipe 25 the water flows into the intake chamber 29 of the casing 24 and then through the open valve seat 31 into the outlet chamber 30 from which point the water flows through the outlet pipe 44 and the hose 3 into the base portion 1 of the sprinkler. From the base of the sprinkler the water is distributed through the spray wheel 2 to rotate the same to cause a centrifugal distribution of the water for the purpose of sprinkling the lawn.

With the valve 32 in open position and the water passing through the main portion of the device a small quantity of the water passes from the intake pipe 25 downwardly through the passage in the by-pass pipe 27 and through the filtering screen 18 which acts to remove dirt and other foreign matter from the water entering the passage 10. The water entering the pipe 10 flows into the valve sleeve 13 and passes around the adjusted needle valve 14 entering the compression chamber 6 of the base 4. When the compression chamber 6 becomes filled with water the pressure is gradually increased until it equals the pressure in the main pipe line, after which the increase in the pressure within the chamber 6 acts to deflect the diaphragm 20 upwards thereby sliding the rod 38 upwards against the action of the spring 42. When this operation occurs the locking hook 37 is moved out of locking engagement with the groove 36 of the main valve stem 35 thereby automatically releasing the main valve 32 permitting the flow of water from the hose 3 and the action of the control spring 33 to seat the valve 32 in the valve seat 31 thereby automatically shutting off the supply of water to the sprinkler, after it has sprayed for a predetermined length of time.

The sprinkler may now be moved into another position on the lawn after which the plug 8 in the base portion 4 may be removed thereby allowing the water within the chamber 6 to flow therefrom to release the pressure within said chamber. The plug may then be put back into position and the plunger rod 46 is then pushed inwardly moving the valve 32 into open position so that the hook 47 may again lockingly engage in the valve stem groove 36 to hold the valve 32 in open position against the action of the spring 33. The supply of water to the hose 3 may now again be turned on and the operation repeated.

With the needle valve 14 controlling the filling up of the pressure chamber 6 it will be seen that the device may be readily set to cause the sprinkler to spray for any desired period of time.

While the automatic timing valve is shown in connection with a water sprinkling device it will of course be understood that the improved valve mechanism may be used in any other suitable combination desired for automatically controlling the flow and distribution of liquids.

We are aware that many changes may be made, and numerous details of construction may be varied through a wide range without departing from the principles of this invention, and we therefore do not purpose limiting the patent granted hereon, otherwise than necessitated by the prior art.

We claim as our invention:

1. An automatic timing valve mechanism comprising a casing, a partition therein formed with a valve seat, an intake pipe connected with one end of said casing, an outlet pipe connected with the opposite end of said casing, a main valve, a control spring for holding the same seated in said valve seat, a guide sleeve formed on said partition, a latch hook engaged therewith, a valve stem connected with said main valve and having a groove therein in which said latch hook is adapted to engage to hold the main valve in an open position against the action of said spring, a spring for holding the latch hook in locked position, a chambered base section below said casing, a by-pass connecting said section with said pipe, a diaphragm on said base section below said latch hook, a filtering screen in said by-pass pipe, and an adjustable needle valve device in said by-pass pipe below the filter screen to control the seepage of water from said intake pipe into the base section below said diaphragm to govern the length of time necessary for the filling of said base section before the diaphragm is deflected to automatically release the latch hook to permit the spring in the intake pipe to automatically close the main valve and shut off the flow of liquid through the casing.

2. An automatic timing device comprising a partitioned valve casing having a valve seat formed therein, a main control valve, a grooved stem connected therewith, a latching device, means for moving the grooved valve stem and the main control valve into a position to permit the latching device to lockingly engage said grooved valve stem to hold the valve in open position, a diaphragm mechanism for co-action with said latching device, and an auxiliary valve device adapted to be adjusted to cause automatic operation of said diaphragm mechanism at a predetermined time to automatically release said latching device to permit the main control valve to seat in said valve seat to shut off the flow of liquid through said casing.

3. An automatic timing device comprising a valve casing, a partition therein having a valve seat formed therein, a main control valve, a spring for holding said main control valve in said valve seat, a grooved valve stem connected with said main control valve, a latching device, a plunger for sliding said

grooved valve stem into a position to permit the latching device to lockingly engage the valve stem to hold the main control valve in open position, a chambered base section, a diaphragm therein below said latching device, a by-pass pipe connecting said casing with said base section, a filter in said by-pass pipe, a needle valve in said by-pass pipe to govern the flow of liquid from said casing into said base section below the diaphragm, and means connected with said needle valve to set the same in a predetermined adjusted position to control the time of operation of said diaphragm and the automatic releasing of said latching device at a predetermined time.

In testimony whereof, we have hereunto subscribed our names.

GUNNAR E. LUNDBERG.
IVAR JEPPSSON.