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H. B. SHERMAN

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DRAIN VALVE FOR LAWN SPRINKLING SYSTEMS

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Fig. 1.

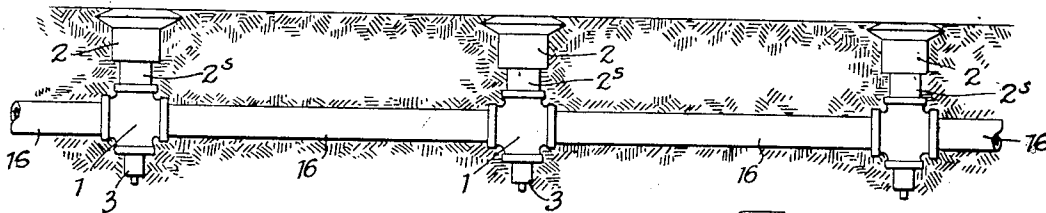


Fig. 2.

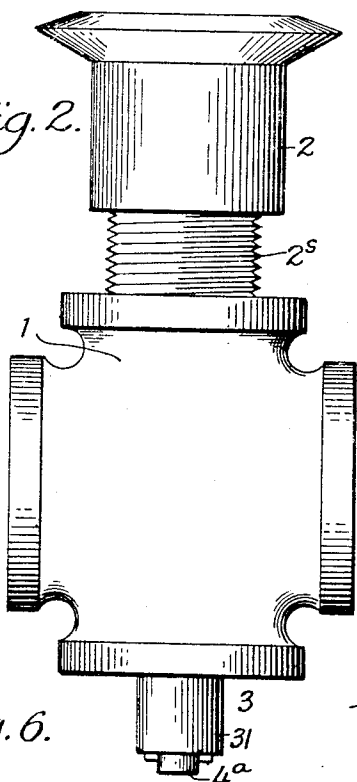


Fig. 3.

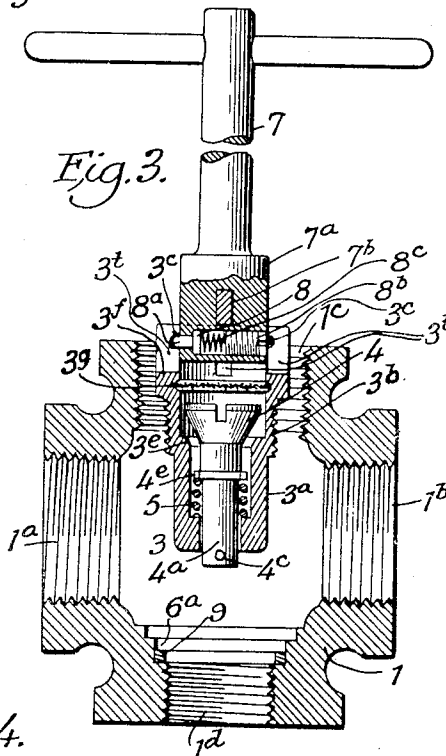


Fig. 4.

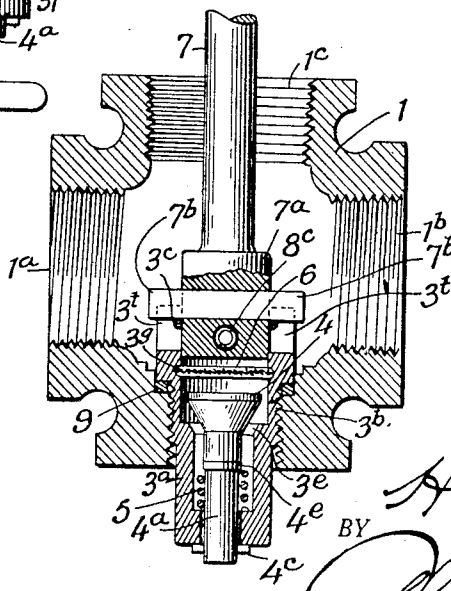
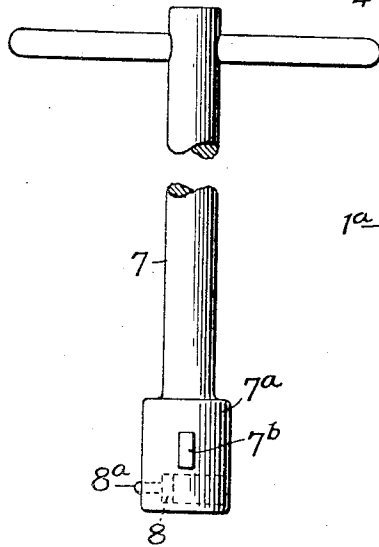
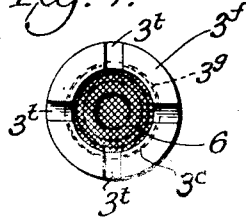


Fig. 5.



Fig. 7.



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## UNITED STATES PATENT OFFICE.

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## DRAIN VALVE FOR LAWN-SPRINKLING SYSTEMS.

Application filed November 21, 1927. Serial No. 234,709.

This invention is an improvement in underground lawn sprinkler systems, such as shown in my pending application (Case 7439) filed July 5, 1927, Serial No. 203,443, which can be cheaply and easily installed by ordinary labor and is automatically self-draining when not in use; and it provides an automatic drain valve that can be easily removed and replaced in case of trouble without having to dig up any portion of the system, and which will be reliable and efficient in operation.

Ordinarily if a drain valve for some unforeseen reason gives trouble, to get at the faulty drain valve that part of the system containing it must be dug up, involving considerable expense and disfiguring the lawn in so doing.

My present invention provides an automatic drain valve that can be easily removed and replaced through the sprinkler head and is inexpensive and economical.

The accompanying drawing illustrates such valve, as used in a lawn sprinkling system, and I will describe the same with reference thereto, and summarize in the claims the novel features of construction, and novel combinations of parts for which protection is desired.

In said drawings,—

Figure 1 is a diagrammatic view of part of a sprinkler system equipped with my novel drain valves;

Fig. 2 is an enlarged side view of one of the units of the system, equipped with a drain valve;

Fig. 3 is a vertical section through the body and drain valve detached and shows the tool used to remove or replace the drain valve;

Fig. 4 is a similar sectional view showing the valve in place in the body;

Fig. 5 is a detail view of the valve 4;

Fig. 6 is a detail view of the tool detached;

Fig. 7 is a detail top plan view of the drain valve.

Lawn sprinkler systems ordinarily include a number of units, each comprising a hollow body 1, to which is attached a sprinkler head 2, and a drain valve 3.

A number of these units may be placed at different points in the area to be sprinkled, with the sprinkler head uppermost and the

drain valves lowermost, and the bodies of adjacent units are connected by water pipes 16, which are connected to any suitable water supply.

In the particular embodiment of the invention illustrated in the drawings the body 1 is provided with horizontally disposed openings, 1<sup>a</sup> and 1<sup>b</sup> on opposite sides to which are connected the water supply pipes 16. The body is also provided with upper and lower vertically disposed openings 1<sup>c</sup> and 1<sup>d</sup>.

The upper opening is connected by a pipe section 2<sup>a</sup> with a sprinkler head 2. The pipe sections 2<sup>a</sup> vary in length, according to the depth at which the body is placed below the surface of the ground, as the upper end of the head 2 should be flush with the surface of the ground as indicated in Fig. 1.

The sprinkler head is preferably constructed as shown and described in my aforesaid application, and needs no further detailed explanation herein.

The drain valve 3 is removably mounted in the lower opening 1<sup>d</sup> of the body 1, and can be placed therein or removed therefrom, by means of a suitable tool (Fig. 6).

Each drain valve 3 comprises a cylindrical casing having a lower cylindrical portion 3<sup>a</sup> of less diameter than the lower opening in the body; and above part 3<sup>a</sup> is a somewhat enlarged and externally threaded portion 3<sup>b</sup> adapted to engage the internally threaded lower opening in the body 1; and above part 3<sup>b</sup> is an enlarged tubular cylindrical portion 3<sup>c</sup>, which is preferably of larger diameter than the externally threaded portion 3<sup>b</sup>. The lower end of the part 3<sup>c</sup> is adapted to fit within an annular recess 6<sup>a</sup> in the opening 1<sup>d</sup> of the body above the threaded portion thereof. A water-tight joint can be formed between the part 3<sup>c</sup> and the body by a lead or other washer 9 which enables the valve to be set water tight in the body or casing without having to be screwed so rigidly into the body.

The valve casing 3 also has a valve seat 3<sup>d</sup>, within the portion 3<sup>b</sup> and below the cylindrical portion 3<sup>c</sup>, on which a valve 4 is adapted to seat; valve 4 has a stem 4<sup>a</sup> that extends loosely through an opening in the lower end of the casing and may be retained by a pin 4<sup>b</sup>. The valve 4 is normally held in raised open position by means of a spring 5 inter-

posed between the bottom of the casing and an annular flange 4<sup>a</sup> on the stem 4<sup>a</sup>.

The upper portion 3<sup>t</sup> of the casing is provided with pairs of diametrically opposite 5 radial slots 3<sup>t</sup>; and with an annular groove 3<sup>c</sup> in its inner wall just below the upper edge thereof. These slots and grooves are for engagement of a tool for inserting and removing the valve as hereinafter explained. 10 The slots 3<sup>t</sup> extend below the groove 3<sup>c</sup> and just below these slots is an annular groove 3<sup>s</sup> in which is secured a screen 6 preferably of fine copper wire. The top of this screen is almost flush with the bottom of the slots 15 3<sup>t</sup>; and the bottom of these slots are almost flush with the lower sides of the openings 1<sup>a</sup>, 1<sup>b</sup> in the body.

In any rotative position of the valve casing, when screwed home, some of the slots 20 3<sup>t</sup> will be almost in direct line with the openings 1<sup>a</sup>, 1<sup>b</sup> and water flowing through the body, when the valve 4 is closed, will pass through the slots 3<sup>t</sup> and across the top of the screen 6 and clean the latter. I have 25 found in actual practice that with such slots the screen is kept clean; and dirt or sediment deposited on the screen will be washed away when pressure is turned on, and the sprinkler is in operation. I have tested this 30 by packing dirt upon the screen within the flange 3<sup>f</sup>, and this dirt was cleared away when the water pressure was turned on.

The screen 6 prevents dirt or scale which may enter the body passing down to the 35 valve seat and thereby impairing the efficiency of the valve by preventing its proper closing under pressure. The stem 4<sup>a</sup> of the valve 4 is so much smaller in diameter than the bore of the lower part of the drain valve casing 3, that any fine dirt that passes 40 through the screen will also pass down beside the stem and out through the opening in the bottom of the casing 3; so that the valve 4 will not be affected by any dirt or 45 grit that might work through the screen.

The valve casing can be readily inserted in position or removed, if necessary for repair, by means of a special tool 7. This tool has a head 7<sup>a</sup> on its lower end adapted to be 50 entered in the upper end 3<sup>t</sup> of the drain valve casing, and is provided with laterally projecting lugs 7<sup>b</sup> adapted to engage diametrically opposite slots 3<sup>t</sup> in the upper end of the valve casing when the tool head is 55 inserted therein (see Figs. 3 and 4). The tool head is also provided below the lugs 7<sup>b</sup> with a spring pressed button 8 confined in a transverse bore in the head and having a shank 8<sup>a</sup>, the outer end of which is rounded. 60 The shank is normally projected by means of a spring 8<sup>c</sup> confined in the bore by a screw plug 8<sup>b</sup>. The shank is adapted to engage in the groove 3<sup>c</sup> when the tool is inserted in the casing as shown in Figs. 3 65 and 4 and the valve casing can be then

turned to unscrew it, when unscrewed it can be lifted out of the body by reason of the engagement of the shank 8<sup>a</sup> in the channel 3<sup>c</sup>.

When the drain valve casing has been 70 screwed home, the shank 8<sup>a</sup> can be disengaged from the channel 3<sup>c</sup> by an upward pull on the tool. When the drain valve casing 3 is to be placed in or removed from the body 1, the head 2, which constitutes a 75 sprinkling chamber, should be removed as described in my aforesaid companion application.

The drain valve opens automatically when there is no pressure in the pipes, and is removable and replaceable without having to 80 disturb the fittings, and without having to dig up any portion of the system and it can be removed from or replaced in the body with the special tool shown without requiring the services of a mechanic. 85

I claim:

1. A drain valve for the purpose specified, comprising a casing having an intermediate 90 externally threaded portion, a cylindric tubular portion above the threaded portion, slots in the cylindric portion for the engagement of a suitable tool or wrench, and a valve seat below the said slots; an inwardly opening valve in said casing; and a screen in the 95 casing below the slots and above the valve.

2. A removable drain valve for a unit in lawn sprinkling apparatus; comprising a cylindric casing having slots in its upper end 100 for the engagement of a tool or wrench, and an internal groove near its upper edge adapted to be engaged by said tool for inserting and removing the drain valve when the unit is in position in the ground; said casing having an internal valve seat below 105 said slots, and an externally threaded portion below the said slots; an inwardly opening valve in said casing, and a screen in the casing below the slots and above the valve.

3. In a lawn sprinkling apparatus, the 110 combination of a hollow body provided with openings respectively for connection with a water supply, a sprinkler head, and a drain valve; with a drain valve comprising a valve casing provided with external threads to en- 115 gage in one of the openings in the body and slots in its upper end for the engagement of a suitable tool or wrench, and having a valve seat below the said slots; an inwardly opening valve in said casing; and a screen in the 120 casing below the slots and above the valve.

4. In a lawn sprinkling apparatus; the combination of a unit comprising a hollow body provided with openings for connection 125 with a water supply and a sprinkler head and a lower opening for the reception of a drain valve; with a removable drain valve casing in the lower opening of the body having slots in its upper end for the engagement 130 of a tool or wrench, and an internal groove 135

near its upper end adapted to be engaged by said tool for inserting and removing the drain valve when the unit is in position in the ground; said casing having a valve seat 5 below the said slots; an inwardly opening valve in said casing; and a screen in the casing below the slots and above the valve.

5. In a lawn sprinkling apparatus; the combination of a hollow body provided with 10 openings for connection of piping, and top and bottom openings; a sprinkler head connected with the uppermost opening of the body, a drain valve casing externally threaded to engage internal threads in the lower 15 opening in the body and having a cylindric tubular upper end provided with slots for the engagement of a tool or wrench, also said casing having a valve seat below the said slots, an inwardly opening valve in said casing; a spring for normally holding the valve 20 open; and a screen above the valve and below the slots; said slots permitting flow of water over the screen to clear it of deposits; said

drain valve being removable and replaceable when the unit is in position in the ground. 25

6. In a lawn sprinkling apparatus; the combination of a hollow body provided with openings for connection of piping, and top and bottom openings; a sprinkler head connected with the uppermost opening of the 30 body; a drain valve casing having external threads to engage internal threads in the lower opening in the body and having a cylindric upper end provided with slots and a groove adapted to be engaged by a suitable 35 tool for inserting and removing the drain valve when the body is in position in the ground; said casing having a valve seat below the said slots and groove, an inwardly opening valve in said casing; a spring for 40 normally holding the valve open; and a screen above the valve and below the slots; said slots permitting flow of water over the screen to clear it of deposits.

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