

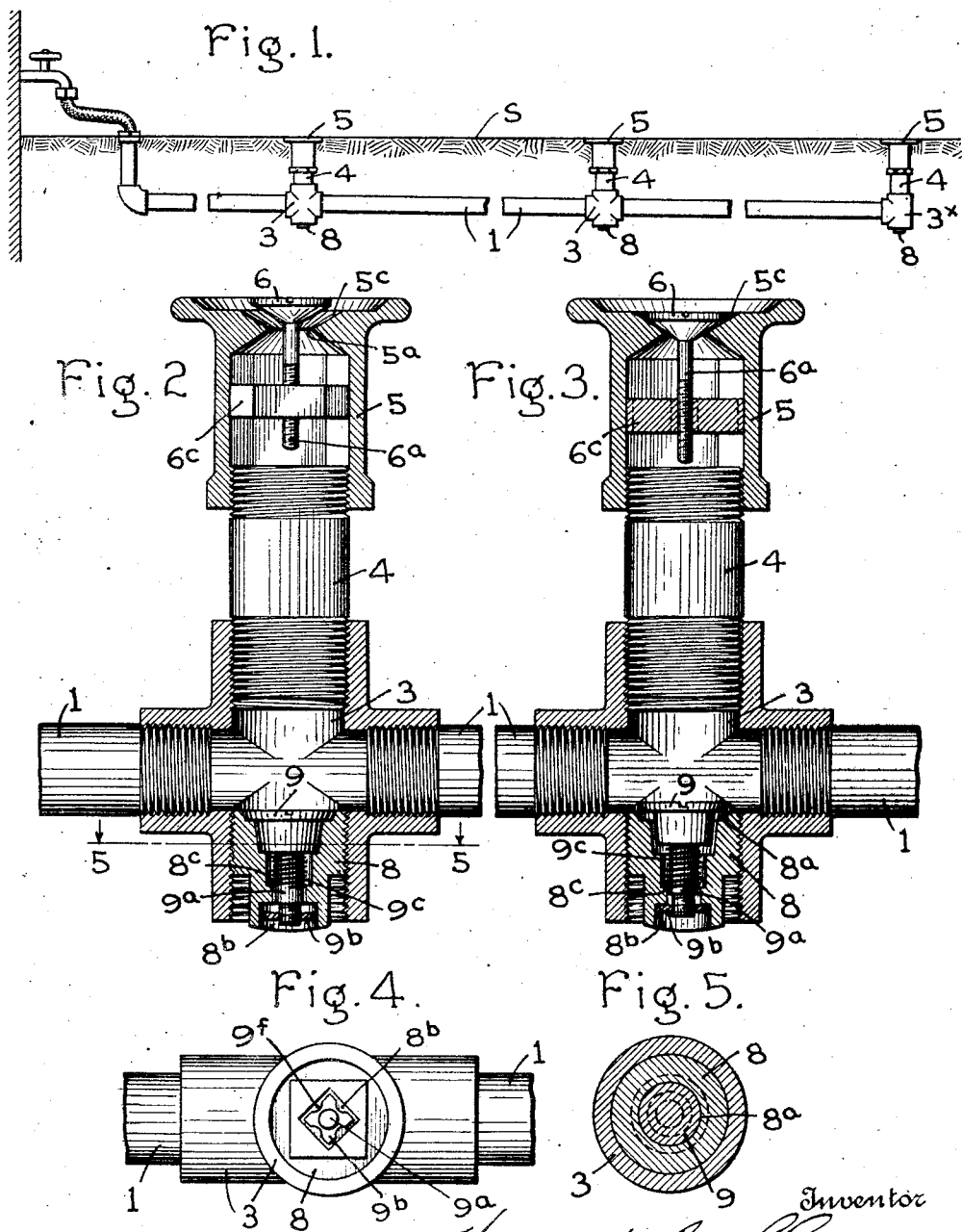
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H. B. SHERMAN

SPRING OPENABLE DRAIN VALVE

Original Filed Jan. 19, 1922



Inventor
Howard B. Sherman
By *Alexander D. Dowd*
Attorneys

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UNITED STATES PATENT OFFICE.

HOWARD B. SHERMAN, OF BATTLE CREEK, MICHIGAN.

SPRING-OPENABLE DRAIN VALVE.

Original application filed January 19, 1922, Serial No. 530,319. Divided and this application filed February 14, 1923. Serial No. 618,992.

This invention is a novel improvement in sprinkler systems for sprinkling lawns, gardens and the like by means of sprinkler heads disposed at regular intervals on the

5 surface to be sprinkled and supplied with water from pipes buried beneath such surface. The present case is a division of my application for patent (Case #6814) filed January 19, 1922, Serial #530,319.

10 The object of the invention is to provide a novel drain valve whereby the sprinkler heads and supply pipes may be automatically drained when the water supply is cut off.

I will explain the invention with reference 15 to the accompanying drawings, which illustrate one practical embodiment of the invention, and summarize in the claims the novel features of construction and novel combinations of parts for which protection is desired.

20 In said drawings:

Fig. 1 is a diagrammatic plan view of a section of a sprinkler system with a series of heads and drain valves.

25 Fig. 2 is an enlarged sectional view of a sprinkler head, the related cross connection, and the related drain valve, the parts being shown in the positions assumed when sprinkling.

30 Fig. 3 is a view similar to Fig. 2 showing parts in the positions assumed when not sprinkling.

Fig. 4 is a bottom plan view of the drain valve.

35 Fig. 5 is a transverse section on the line 5—5 Fig. 2.

In practically utilizing the invention a number of sprinkler heads 5 are employed, located at different points of the surface to be sprinkled and preferably at or below the level of the surface, and supplied with water by a supply pipe 1 laid under ground, and preferably arranged so that its inlet end is nearer the surface of the ground than its 45 outlet end, but this is not essential.

As shown each sprinkler head 5 comprises a tubular body threaded at its lower end for engagement with the upper threaded end of a pipe section 4, and provided with a central orifice 5^a in its upper end surrounded by a tapered concavity 5^c, in which is located a conical deflector disk 6 on the upper end of a stem 6^a which depends through the orifice 5^a and is preferably adjustably connected at

its lower end to a guide or bridge piece 6^c 55 within the body.

Preferably each pipe section 4 leading to an intermediate head 5 of the series is connected to the upper end of a cross coupling 3, such as is commonly used in plumbing, 60 having four branches. The two horizontal branches of this coupling are connected to adjacent sections of pipe 1, and screwed thereto in the usual manner. The other 65 branches of the coupling 3 are arranged perpendicular to the pipe; and into the upper branch is screwed the lower end of the pipe section 4 to the upper end of which a sprinkler head 5 is attached; and into the lower vertical branch of the coupling 3 is 70 screwed the drip valve.

When the water is shut off from the pipe 1 such pipe should be drained. In my invention the water is automatically drained 75 from each sprinkler head or cross coupling by an automatic spring openable drain valve placed below or adjacent each sprinkler head so as to insure drainage therefrom. This novel automatic spring openable drain valve forms the subject matter of the present ap- 80 plication.

As shown in the drawings this drain valve comprises an externally threaded tubular plug 8 screwed into the lower branch of the cross-coupling 3, and having a central bore 85 provided with a valve seat 8^a at its upper end upon which is adapted to seat a valve disk 9 attached to a stem 9^a extending through the axial bore in the plug, below the seat, and having a nut 9^b on its lower threaded 90 end which is concealed in an enlarged recess 8^b at the lower end of the bore. The recess 8^b and nut 9^b are preferably non-circular, as indicated in Fig. 4, so that the nut can not turn in the recess, but can slide therein with 95 the stem. The nut 9^b is preferably cut away at its sides, as shown at 9^c in Fig. 4 to permit water to freely drain and escape into the ground.

The disk 9 is normally held in open position 100 when the water is turned off, by means of an expansion spring 9^c strung on the stem 9^a between the valve disk 9 and a shoulder 8^c in the bore of the plug. The parts of the drain valve are preferably made of non- 105 corrosive metal.

When the water is turned into the pipe 1 the pressure forces the valve disk 9 to its

seat against the action of the spring 9°, and when the disk is seated the flow of water through the bore of the plug is prevented. When the water is cut off from pipe 1 the pressure is relieved and the spring 9° raises valve disk 9 and the water then drains out of the valve past the stem.

The pipe 1 may be of any desired length and any number of sprinkler heads may be attached thereto, according to the length of the surface S to be sprinkled and the desired distance apart of the heads 5. The last sprinkler head may be connected with the pipe 1 by means of a T 3* if desired, and the drain valve placed in the lower end of the T as indicated in Fig. 1.

The supply pipes 1 are preferably laid immediately below the surface while the sprinkler heads are preferably set flush with the roots of the grass, so that the lawn can be cut with a lawn mower without interfering with the heads. When it is desired to sprinkle the lawn the water is turned into a section of this piping, and the series of connected heads 5 begin to operate; then when such area of lawn is properly sprinkled this section is cut off, and another section turned on. The heads 5 will spray the water over a large surface thus reducing the number of heads required for a given area. Fig. 1 of the drawings simply indicates one section of a sprinkler system, but it is obvious that any desired number of such sections may be used according to the area to be covered.

The said automatic drain valves are easy of installation, and automatic in operation. With such novel drain valves it is not necessary to lay the pipe so that it will slope to a certain point to enable it to be drained. They require no special mechanical skill on the part of the installer. They can be installed by using ordinary piping and malleable iron fittings now on the market, and do not have to be looked after in cold weather; and when the water pressure is cut off the drain valves automatically open and the water is drained out of the pipes.

What I claim is:

1. An automatic spring openable drain valve comprising a tubular plug having an axial bore, a valve seat at the inner end of its bore, a shoulder below the seat, and a non-cylindric recess below the shoulder; a valve disk adapted to fit said seat and having a stem depending through the bore and into the recess below said shoulder, a non-cylindric nut on the stem to retain the valve disk

in the plug and limit its opening movement, said nut permitting water to pass through the recess and being slidably but non-rotatably confined in said non-cylindric recess; and a spring for automatically unseating the said valve disk when the water pressure is cut off.

2. In combination, a water supply pipe; a coupling connected in said pipe; a drain valve in the lower branch of said coupling, said valve comprising a plug having an axial bore, a valve seat at the upper end of said bore, a valve disk for said seat; a stem connected to said disk, the lower end of said bore being non-cylindrical, and a non-cylindrical member on the lower end of said stem slidably and non-rotatably confined in said recess but permitting water to pass therethrough, and adapted to limit the opening movement of said disk.

3. In combination an underground water supply pipe; a coupling connected to said pipe; a drain valve in the lower branch of said coupling; said drain valve comprising a plug having an axial bore; a valve seat at the upper end of said bore; a valve disk fitted to said seat; a valve stem connected with the disk, the lower end of said bore being non-cylindrical, a non-cylindrical member on the lower end of said stem slidably and non-rotatably confined in said recess but permitting water to pass therethrough and adapted to limit the opening movement of said disk; and a spring adapted to automatically lift the valve disk when the water supply is cut off.

4. An automatic spring openable drain valve, comprising an externally threaded plug adapted to be screwed into a member to be drained; said plug having an axial bore, a valve seat at the upper end of the bore, a shoulder below the seat; and a non-cylindric recess below said shoulder; a valve disk adapted to fit said seat and having a stem depending through the bore and below said shoulder, and into said recess; spring means for automatically normally lifting the disk when the water pressure is cut off, and a non-cylindric member on the lower end of said stem slidably engaging the walls of said non-cylindric recess but allowing water to pass therethrough and adapted to limit the opening movement of the disk.

In testimony that I claim the foregoing as my own, I affix my signature.

HOWARD B. SHERMAN.