

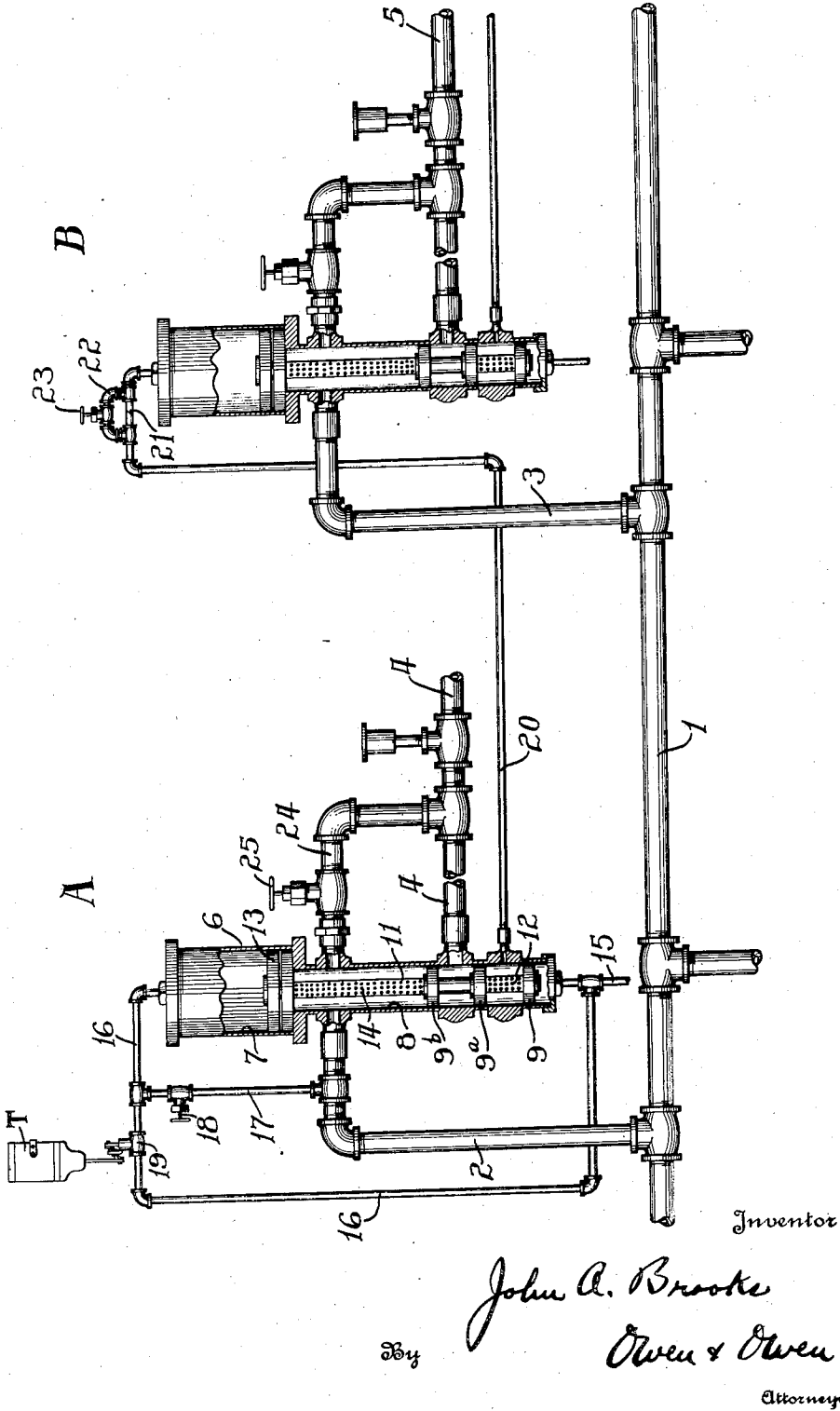
Aug. 9, 1927.

J. A. BROOKS

1,638,519

AUTOMATIC SPRINKLING SYSTEM

Filed Nov. 18, 1926



UNITED STATES PATENT OFFICE.

JOHN A. BROOKS, OF DETROIT, MICHIGAN.

AUTOMATIC SPRINKLING SYSTEM.

Application filed November 18, 1926. Serial No. 149,028.

This invention relates to sprinkling systems, but particularly to lawn sprinkling systems of the type adapted to form a spray for a predetermined period of time, and then automatically stop.

Objects of this invention are to provide a sprinkling system with valves which may be connected to the same or separate sources of supply, but are dependent upon each other for successive operation; to provide adjustable means in such system which enables each valve to operate for a predetermined period before the next valve is brought into operation, so that one valve may supply fluid to its distributing line for a longer or shorter period than the other valves of the system; and to provide a sprinkling system having the new and improved features of construction, arrangement and operation hereinafter described.

The invention is illustrated in the accompanying drawings, in which the figure is a fragmentary elevation partly in section showing two units and their operative connections.

The form of the invention shown in the drawing comprises a master or main control unit A and an auxiliary unit B, and although one auxiliary unit is shown, it is to be understood that any desired number may be employed. The master unit A and control unit B are independently connected to a source of liquid supply, and, in this instance, each unit is connected to a main line 1 from which extends a branch 2 to the master unit A, and a branch 3 to the auxiliary unit B. From each unit leads a duct through which liquid passes for spraying purposes, but normally these ducts are not in communication with the main supply. From the main control unit A extends a duct 4, and from the auxiliary unit extends a duct 5.

The construction of the master unit A and auxiliary unit B, is the same, the difference between the two units being in the connections which provide ducts for admitting and draining the fluid. The master unit is started in operation by some external force, and in this instance, by a time clock T, which opens the valve 19 at a certain predetermined time, and starts the system in operation, and opens communication between the branch 2 and duct 4, thereby permitting liquid to pass out through the duct

to the spray head (not shown) at the end of this line, as will be understood by those skilled in this art.

The master unit A remains in operation for a definite period, and then ceases operation, cutting off communication between the branch 2 and duct 4. Thereafter, the auxiliary unit B functions to permit liquid passage from the branch 3 to the duct 5, and this unit continues in operation for a definite predetermined period and then stops. Each succeeding unit functions in a similar manner, and any required number of units may be employed.

Each unit includes a movable valve member which controls the passage of liquid from the main supply line 1 to the respective distributing lines of each unit. These valve members may be moved to such position that the water may be drained from the system so that the danger of freezing the water in the pipes and bursting of pipes, is prevented. As will hereinafter be described, the rate of travel of each valve member may be independently controlled, thereby enabling more water to be sprayed in one locality than in others in accordance with the demand of service.

Referring more particularly to the drawings, the valve construction of each unit is identical so that detail description of the main control valve A will suffice. This construction consists of a casing which is generally indicated by the numeral 6, and this casing is divided into a large operating chamber 7, and a small elongate chamber 8, the duct 4 extending at right angles from the side of the chamber 8. Longitudinally movable in the elongate chamber 8 is a valve composed of longitudinally spaced packings 9, 9^a and 9^b, which are secured to a hollow stem 11 provided with perforations 12 between the packings 9 and 9^a. To actuate the valve member, a piston 13 is fixed to the opposite end of the stem 11, and is reciprocable in the large chamber 7. The stem 11 is also provided with perforations 14 between the packing 9^b and the piston 13.

When the packings 9 and 9^a are positioned on opposite sides of the opening leading to the duct 4, water may pass through the perforations 14, through the bore of the stem, and out through the perforations 12. No liquid may pass into the

duct 4 when the packings 9^a and 9^b are disposed on opposite sides of the outlet to the duct 4.

The valve unit is disposed in a vertical position, and liquid may be drained through a relatively small drain pipe 15 extending from the lower end of the casing 6. Connecting the drain pipe 15, and top of the chamber 7 is a pipe 16 which permits liquid above the piston 13 to be drained from the chamber 7. Liquid may be by-passed from the branch 2 through a pipe 17 into the pipe 16 for building up pressure in the chamber 7 for actuating the piston 13. The rate of movement of the piston 13 may be controlled by a valve 18 on the pipe 17, which controls the liquid flow therethrough. By regulating the valve 18, the liquid flow through the pipe 17 may be increased or diminished, so that the movement of the piston 13 is accordingly changed. Connected to the pipe 16 between the drain pipe 15 and pipe 17 is a valve 19, which is operated by the time controlled mechanism T.

In order to raise the valve member in the casing 6, the valve 19 is opened by the mechanism T, and this permits the liquid above the piston 13 to pass to the drain 15 through the pipe 16. This movement is obtained, because of the unequal areas of the piston 13, and packing 9^b. After the valve member has moved to its uppermost position, the mechanism T operates to close the valve 19, and thereafter the liquid passes through the pipe 17 and 16 to build up sufficient pressure on top of the piston 13 for moving the valve member downwardly. As above described, when the valve member reaches the proper position relatively to the duct 4, liquid passes from the branch 2 to the duct 4. The valve member remains in its lowermost position until the mechanism T again operates.

The operation of the auxiliary unit B is controlled by the main or master unit A, and for this purpose a pipe 20 extends from the lower end of the elongate chamber 8 of the unit A to the top of the large piston chamber of the unit B. Disposed in the pipe 20 is a suitable valve 21, which permits liquid flow from the unit B to the unit A, but prevents liquid flow in the opposite direction. In order to permit liquid flow from the unit A to the unit B for building up pressure for actuating the piston of unit B, a by-pass pipe 22 is connected at opposite ends to the pipe 20, and bridges the check valve 21. The passage of liquid through the by-pass pipe 22 is controlled by an adjustable valve 23.

The operation of the auxiliary unit B will be readily understood. When the valve member of the unit A is in its lowermost position, liquid passes from the hollow stem 11 through the perforations 12 into

the pipe 20. The check valve 21 prevents liquid passage in this direction, and so the liquid flows through the by-pass pipe 22 into the auxiliary unit B to actuate the piston as heretofore described in connection with unit A. The valve 23 may be adjusted to increase or diminish the rate of movement of the piston of the unit B. When the valve member of the unit A is in its uppermost position, liquid above the piston in the unit B is forced into the pipe 20, past the one-way valve 21, into the lower part of the elongate chamber 8, and into the drain pipe 15. Movement of the piston of the unit B downwardly takes place, as above mentioned, after the valve member of the unit A has moved downward so that liquid may be supplied to the pipe 20.

In order to enable each unit to be manually operable so that liquid may be delivered to the respective distributing lines independently of each other, a duct 24 leads from the elongate chamber 8 at a place, as in the unit A, opposite the branch 2. The duct 24 connects at its opposite end with the duct 4 and a control valve 25 is provided in the duct 24 so that liquid may be passed from the branch 2 into the duct 4 without operating the valve device.

It will be seen that I have provided a construction which satisfies the objects enumerated above, and one which constitutes a valuable advance in the art. While I have shown the invention in a certain physical embodiment, it is to be understood that modifications of the structure shown may be made by those skilled in this art without departing from my invention as expressed in the following claims.

What I claim as new and desire to secure by Letters Patent is:

1. In an automatic spraying system, a plurality of control units, each unit having a fluid pressure controlled valve, a liquid supply duct individual to each unit, a liquid discharge duct for each unit, said valve being movable for a predetermined period to a position to connect said ducts, a connection between adjacent units whereby fluid flows from the first unit to second unit, thereby to build up pressure to actuate the valve in the second unit.

2. In an automatic spraying system, a plurality of control units, each control unit having a fluid operated valve member, a liquid supply duct individual to each unit, a discharge duct extending from each unit, said valve member being movable to establish connection between said ducts for a predetermined period, a duct extending from said supply duct of the first unit to one end of said valve member for building up pressure to actuate the same, and a duct connecting one end of the first unit with the upper portion of the second unit, thereby to supply

fluid from the first unit to the second unit to build up pressure on the second unit to actuate the valve member after the first unit has operated.

5 3. In an automatic spraying system, a plurality of control units, a supply duct for each unit, a discharge duct for each unit, a movable valve member in each unit for establishing communication between said ducts
10 for a predetermined period, means for by-passing pressure fluid from the supply duct to the first unit for building up a pressure above the respective valve members for actuation thereof, and a connection between the
15 opposite end portion of said first unit and the upper part of the second unit for admitting pressure fluid to the second unit from the first unit for automatically actuating the valve member in the second unit.

20 4. In an automatic spraying system, a plurality of control units, a supply duct for each unit, a discharge duct for each unit, a valve member in each unit movable to establish communication between said ducts, means
25 for supplying pressure fluid to the valve member of the first unit for actuating the same, a drain pipe leading from said first unit, and a duct from the first unit to the second unit to supply pressure fluid for actu-

ating the valve member in the second unit, 30 the valve member in the first unit being movable to establish communication between the supply duct and said last duct, and when such communication is broken, pressure fluid may discharge from the second unit into 35 said drain pipe.

5. In an automatic sprinkling system, a plurality of control units, a separate duct for supplying liquid to each unit, a spraying duct leading from each unit, each control unit having means for affording communication between said ducts for a predetermined period, and means controlled by a preceding unit and operable after said unit has substantially completed its operation for 45 starting a succeeding unit into operation.

6. In an automatic sprinkling system, having a plurality of control units, a separate supply duct for each unit, a separate discharge duct for each unit, and means controlled by fluid pressure from a preceding 50 unit to operate a succeeding unit after the former has approached the end of its spraying period.

In testimony whereof I have hereunto 55 signed my name to this specification.

JOHN A. BROOKS.