

[54] **MULTI-PURPOSE WATERING EQUIPMENT**

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[22] Filed: **Dec. 23, 1970**

[21] Appl. No.: **101,078**

[30] **Foreign Application Priority Data**

Dec. 24, 1969 France.....6945031

[52] U.S. Cl.....**239/267**

[51] Int. Cl.....**A01g 25/02**

[58] Field of Search.....239/266, 267, 268, 269, 279, 239/450

[56] **References Cited**

UNITED STATES PATENTS

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[57] **ABSTRACT**

An assembly of elements constituting divisible and selective watering equipment which can be used along the edges of pathways, the assembly comprising a number of sectional elements of the same multi-bore cross-section assembled together, the number of elements being sufficient to give the required total length. By assembling the elements a continuous duct is formed right through the assembly, through which water is supplied, and in each section element is a branch duct equipped with sprinklers and discharge-regulating means to enable the water sprinkled from each sectional element to be regulated independently as a function of the requirements of the zone that it is watering.

8 Claims, 15 Drawing Figures

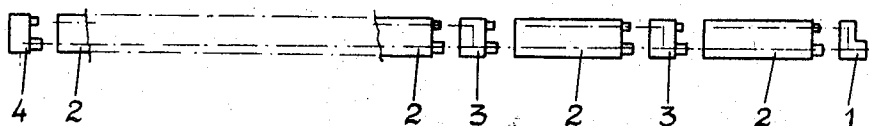


FIG. 1

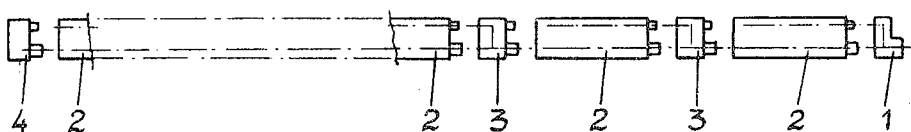


FIG. 2

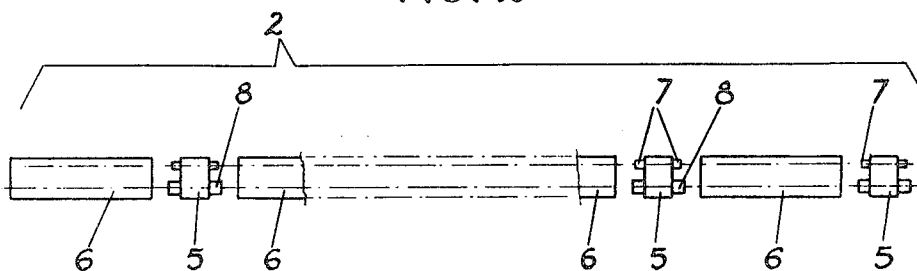


FIG. 3

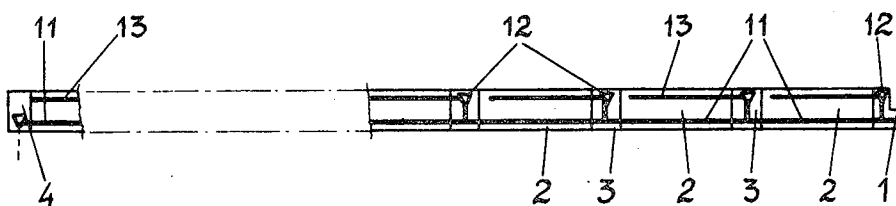


FIG. 5

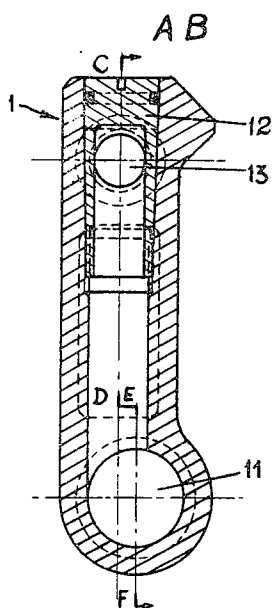


FIG. 4

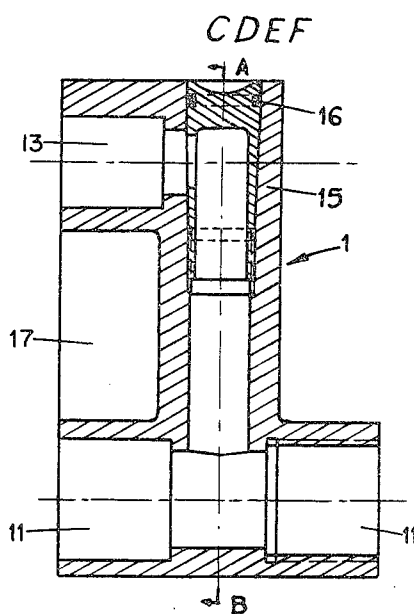


FIG. 6

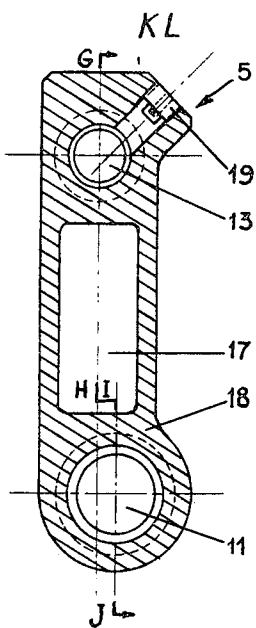


FIG. 7

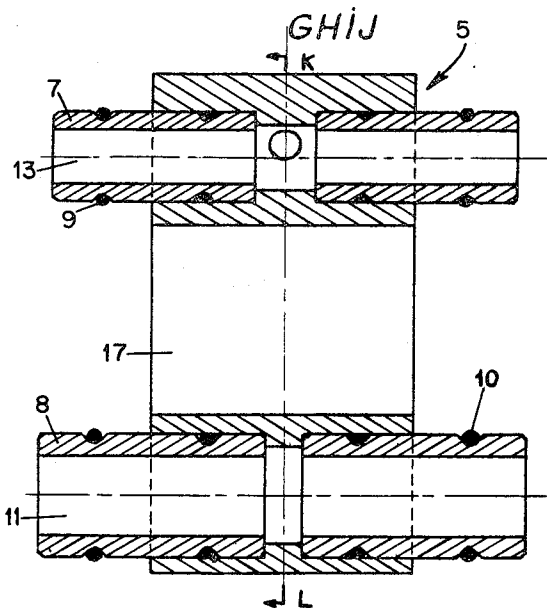


FIG. 9

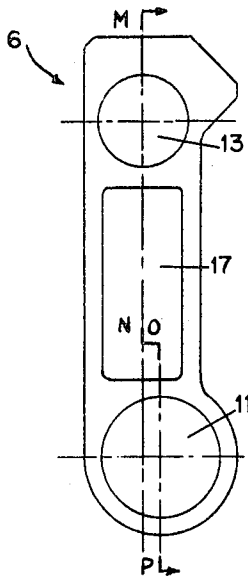


FIG. 8

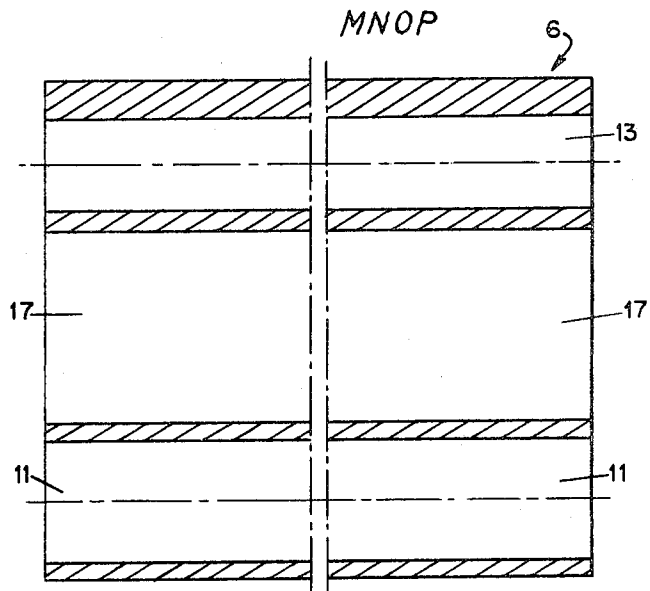


FIG. 10

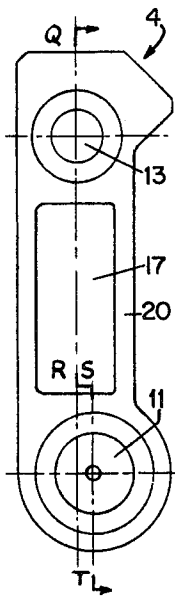


FIG. 11

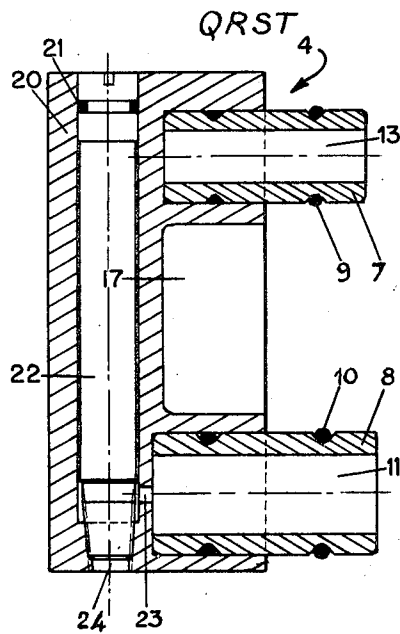


FIG. 12

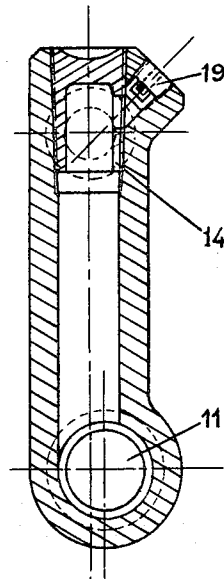


FIG. 14

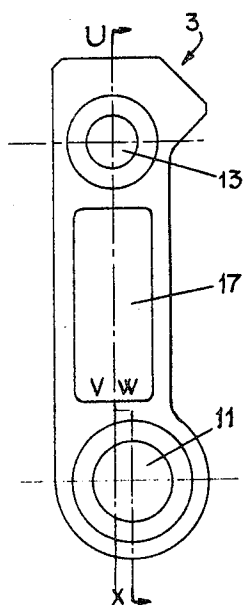


FIG. 13

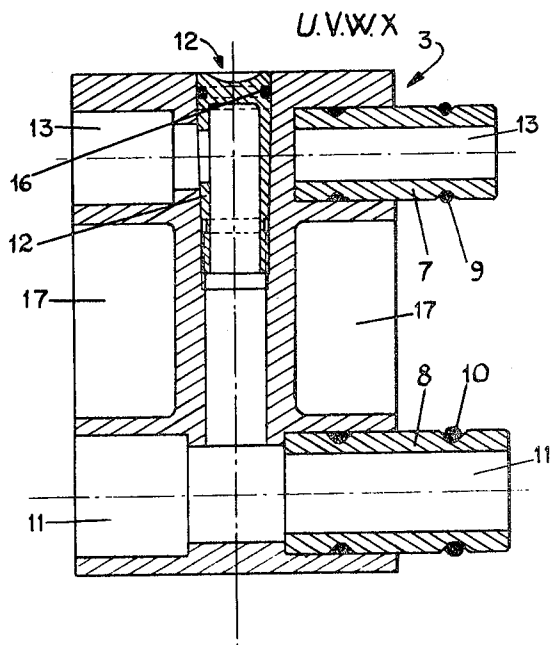
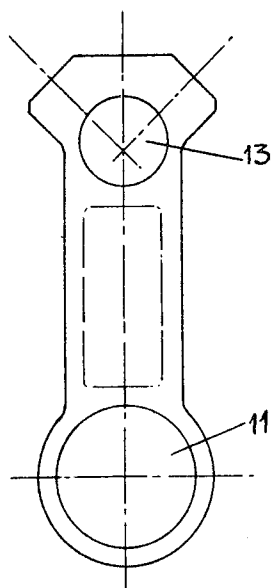


FIG. 15



MULTI-PURPOSE WATERING EQUIPMENT

FIELD OF THE INVENTION

The present invention relates to an assembly of elements which constitute a new multi-purpose watering system.

As is well known, the watering of a large area with the help of a water-hose nozzle or a conventional apparatus can only be carried out zone by zone by moving the supply hose.

BACKGROUND OF THE INVENTION

The latter, winding along the pathways and across plant-beds, is always unsightly, troublesome and awkward to move and bring into position.

Perforated hoses carry the same drawbacks. If there is no loss of pressure, they dispense water uniformly over their entire length and, if the latter is considerable, the flow of the jets and, consequently, the width watered are insufficient.

The available water is distributed over the entire surface and the intensity of the watering action is low.

The lengths of these hoses and their efficiency are limited by the water intake as well as by the number and cross-section of the orifices in them.

In practice the holes in them are too small to provide a heavy watering action and to avoid their frequently being blocked by impurities and substances suspended in the water.

SUMMARY OF THE INVENTION

The object of the present invention is to overcome these difficulties and to provide a watering means that is no longer limited as to length, or delivery or pressure of the water supplied to it.

It also offers numerous other advantages over other known methods.

Thus, it can preferably be used only over certain portions of its length, since with it it is possible to carry out limited and selective watering of the various zones constituting the cultivated area.

It also enables the intensity of the watering action to be regulated and to be adapted to suit the requirements of each zone, even when a number of zones are watered simultaneously.

It is also possible to concentrate the entire discharge on a single zone and thus to obtain a maximally intense watering action.

In principle, this invention resides in the use of the ducts of a watering system constituted by a line of several assembled elements, the number of which is such as to provide the total required length.

The invention will be more clearly understood from the following description of an embodiment thereof with reference to the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

In the drawings:

FIG. 1 shows a watering installation consisting of several sectional elements, according to the invention,

FIG. 2 shows a composite water distributor for use in the installation of FIG. 1,

FIG. 3 shows diagrammatically the water circulation in the installation of FIG. 1,

FIGS. 4 and 5 show longitudinal and transverse cross-sections, respectively, of a water intake element shown in FIG. 1,

FIGS. 6 and 7 show transverse and longitudinal cross-sections, respectively, of a watering or junction box shown in FIG. 1,

FIGS. 8 and 9 show a longitudinal cross-section and an end elevation, respectively, of a conduit or tie shown in FIG. 1,

FIGS. 10 and 11 show an end elevation and a longitudinal cross-section, respectively, of a drainage element shown in FIG. 1,

FIG. 12 shows a transverse cross-section of an individually controllable sprinkler element,

FIGS. 13 and 14 show a longitudinal cross-section and an end elevation of a branch duct control element respectively, and

FIG. 15 shows an end elevation of a modified watering or junction box.

DESCRIPTION OF SPECIFIC EMBODIMENT

All the elements are of the same multi-bore and substantially rectangular cross-section as for example that shown in FIG. 9 or FIG. 15.

In these Figures can be seen the ducts 11 and 13 as well as the cavity 17. The latter can however be dispensed with or, depending upon requirements, replaced by one or several cylindrical ducts.

The assembly thus takes the form of a sectional system which may simply be laid flat on the ground or partly buried with the longer side of its cross-section upright.

In the latter case, and if it is dispensing water only on one side of its longitudinal axis, it can be placed at the edge of, and spray water on to, the plant-beds, lawns, etc. along which it is positioned.

This double use covered by the invention, which is not however restricted thereto, is stressed since it enables a watering means and its supply hose, which are often unsightly, to be hidden in a border structure which is both useful and pleasant in appearance.

The border structure thus constituted makes it unnecessary to move hoses in the manner previously mentioned. By virtue of the disposition of its orifices, it also enables cultivated areas to be watered without wetting the pathways that bound them.

A border structure of this kind (see FIG. 1) comprises:

A water intake 1 illustrated in detail in FIGS. 4 and 5.

Water distributors 2.

Branch and discharge regulating elements 3, shown in detail in FIGS. 13 and 14.

A drainage element 4 which enables cleaning to be carried out and permits the border structure to be protected against freezing. This is illustrated in detail in FIGS. 10 and 11.

The number of water distributors 2 and regulating elements 3 depends upon the length of the border structure.

A distributor 2 illustrated in FIG. 2 is constituted by an assembly of a certain number of parts 5 and 6.

The watering box 5 is illustrated in detail in FIGS. 6 and 7.

The tie 6 is shown in detail in FIGS. 8 and 9.

The number of these parts will depend upon the user's requirements, the disposition of the areas to be watered or the discharge rate and pressure of the water mains available to the user.

A watering box 5 and a tie 6 may be combined and moulded or cast as a single part.

Tubular pegs 7 and 8 are used for interconnecting the various elements that have to be assembled. The pegs can be formed integrally with the elements by moulding or casting. Water-tightness is ensured by bonding, or in the case of installations designed to be dismantled, by means of the seals 9 and 10 illustrated in FIGS. 7, 11 and 13.

In a border structure as illustrated in FIG. 1, water is circulated in the manner shown in FIG. 3.

The main feed for the border structure is through the duct 11 which is located in the lower portion and is buried when all the parts are assembled.

This duct is continuous and its length is equal to that of the border structure.

The length of the duct 13 formed in the upper portion of each distributor 2, when the elements of which it is comprised are assembled, is on the other hand equal only to the length of the distributor. This duct does not communicate with the like ducts in the adjoining distributors. By turning the tap 12 in the part 1 or one of the regulating elements 3, some of the water from the main duct 11 is directed into the watering duct 13 of that distributor 2 that it is required to use, and into this distributor only.

The sprinklers 19 in the regulating elements 3 which can be seen in FIG. 6 are supplied with water only through the duct 13.

The method of using this border structure will be readily understood with the help of a description of its component parts and of the attached drawings which show some forms of construction.

A water intake 1 (see FIGS. 1, 3, 4 and 5) comprises:

An element 15 containing a cavity at 17.

A tap 12 fitted with a seal 16. The use of a key 14 as illustrated in FIG. 12 may also be visualized; then, it is not necessary to use a seal element.

The water supplied to the system enters the lower portion of the element 15 through the tapped side of the hole 11 and circulates over the entire length of the border structure. The key 12 enables some of the water to be directed into the duct 13 to feed the distributor 2 located immediately downstream.

If the intake of water is sufficient, the cavity in the moulded or cast part 17 can be replaced by one or several ducts 11 so as to increase the total rate of discharge of the border structure and the number of distributors 2 that can be used simultaneously.

A watering box 5 (see FIGS. 2, 6 and 7) comprises:

An element 18 containing a cavity at 17.

Tubular pegs 7 and 8 for interconnecting the parts to be assembled and for ensuring continuity of the watering ducts 13 and the supply ducts 11.

Sealing elements 9 and 10 used in the case of border structures that can be dismantled.

A sprinkler 19 adapted to direct and atomize the watering jet.

Each sprinkler of a distributor waters a certain area. The number of sprinklers is therefore considerably less than the number of holes in a perforated hose. Consequently, the diameter of their orifices can be sufficiently great not to run the risk of their becoming blocked.

The tie 6 (see FIG. 2) is illustrated in detail in FIGS. 8 and 9. It provides a connection between the watering boxes 5. It contains a cavity at 17.

The border element as a whole is supplied with water through the duct 11 located in its lower portion.

The duct 13 simply ensures circulation of water branched through the discharge-regulating element 3 located immediately upstream.

It is this duct that supplies the sprinklers 19 of the watering boxes 5 of the distributor 2 that is in use.

It will be readily understood that the combination of the boxes 5 with the ties 6 to form a single element falls within the scope of the invention.

This would merely involve fitting the sprinklers 19 directly in the tapped holes provided, these holes being uniformly spaced along the length of the ties.

The required length could be obtained by cutting off a portion of sectional element having a cross-section such as for example those illustrated in FIGS. 9 or 15.

In the case of FIG. 15, the holes can be made along or on each side of the vertical axis of symmetry.

They could be pierced as required or provided on the sectional element. In this case, they are normally blocked by plugs which would simply be removed and replaced by sprinklers so as to render this standard sectional element suitable for any required use.

If all the holes are replaced by sprinklers, the assembly of distributors constitutes a watering means on each side of its longitudinal axis.

If the equipment is to spray water on one side only, it can form a border structure and watering means bounding the cultivated areas.

The branch and discharge-regulating element 3 (see FIGS. 1 and 3) is illustrated in FIGS. 13 and 14. It comprises:

An element containing a cavity at 17.

A tap 12 and its seal 16 (or the key 14 of FIG. 12 fitted without a seal).

Pegs 7 and 8 and their sealing means 9 and 10.

The tap 12 then enables water to be directed into the duct 13 of the distributor 2 located downstream, and into this distributor only.

It is quite obvious that the element could be designed for directing the water in the opposite direction and in this case it would be the upstream distributor that would be supplied with water.

A drainage box 4 (see FIGS. 1, 3, 10 and 11) comprises:

The moulded or cast element 20 containing a cavity at 17.

Tubular pegs 7 and 8.

Seals 9, 10 and 21.

A blocking means 22 which enables water to be drained from the main supply duct 11 through the holes 23 and 24.

It will also be clear that in a border structure of this kind it is possible to incorporate U-shaped, bent, elbowed and T-shaped connecting elements and various branch fittings to enable the possible uses to be increased and to suit the equipment to the contour of the pathways or of the surfaces that are to be watered.

Boxes such as the one illustrated in FIG. 12 and also comprising a tap 12 or 14, of the kind illustrated, and a sprinkler 19 fed directly through the duct 11 can be incorporated at the end of each distributor 2 so as to provide the possibility of watering on a local basis, without having to use all the sprinklers along the distributor.

It is thus also possible to provide supplementary water intakes at certain points along the equipment so that, if required, use can be made of water-hose nozzles or conventional apparatus supplied directly by the main duct 11.

For a large number of reasons and for the purpose of reducing pressure-losses in the ducts, the various elements employed can be made in plastics material.

The equipment forming the subject-matter of the invention can be used as a watering system or as a border structure for forming a boundary to flower-beds, lawns or shrubberies along which it is laid. There is no limit to its length.

It enables cultivated areas to be watered on a local and selective basis.

The addition of certain complementary parts, such as those mentioned by way of example, can also increase its possible applications.

Its use is therefore of particular interest in the case where there is a limit imposed by the rate of delivery or pressure of the water, or in the case of long flower-beds or rectangular plantations of bushes of great length such as those contained between the two halves of a motorway.

I claim:

1. A watering installation comprising: a plurality of distinct pipe-like sections assembled end-to-end, said sections having internal duct configurations which define a continuous main supply duct extending the length of the installation and a plurality of closed-end branch ducts extending generally parallel to the main supply duct each branch duct being in communication with the main supply duct so as to receive water therefrom, at least one water discharge means associated with each branch duct for discharging water to the exterior of the installation, and valve means for controlling the flow of water to the water discharge means without interrupting flow in the main duct.

2. An installation as in claim 1 wherein the valve means between the main supply duct and the branch duct is located at the end of a pipe-like section and in one end of the branch duct, the opposite end of the branch duct being closed.

3. An installation as in claim 2 wherein the valve means is disposed within a relatively short pipe-like section which is connected between two longer pipe-like sections, said water discharge means being associated with the two longer sections.

4. An installation as in claim 1 including a water distributing section which comprises a tying subsection connected end-to-end with a watering subsection, each of said subsections having an open-ended branch duct portion and an open-ended main duct portion, said branch duct portion of the watering subsection having said water discharge means associated

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therewith and the branch duct portion of the tying subsection having imperforate walls.

5. An installation as in claim 4 wherein at least two of said water-distributing sections are connected end-to-end via a regulating subsection which comprises a body having a main duct portion connecting end-to-end with the main duct portions of the two water distributing sections and having a branch duct portion containing said valve means and communicating at one end with the main duct portion of the regulating subsection and communicating at its other end with one end of the branch duct portion of one of the water-distributing sections, the branch duct portion of the other water-distributing section being closed by said regulating section.

6. An installation as in claim 1 wherein each pipe-line section is in the form of a rectangular flat body, the main supply duct and the branch duct being formed at the ends of the cross-section of the flat body, and the intermediate portion of the body being hollow.

7. An installation as in claim 1 wherein at least one of said pipe-like sections is a one-piece integral body having an open-ended main duct portion extending therethrough and having a branch duct portion in communication with the main duct portion at one end thereof via said valve means and extending parallel to the main duct portion.

8. A watering installation comprising: a plurality of distinct body members releasably assembled end-to-end, said body members having internal duct configurations which together define a continuous main supply duct and a plurality of closed-end branch ducts of lesser length than and extending generally parallel to the main supply duct, each branch duct being in communication with the main supply duct at a different location along the length of the latter, a plurality of distinct water discharge means disposed in spaced apart relationship along the length of each branch duct for discharging water from the respective branch duct to exterior of the installation.

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