

Jan. 18, 1944.

R. A. FOLSOM

2,339,632

SPRINKLER PIPE

Filed Nov. 14, 1941

2 Sheets-Sheet 1

Fig. 1.

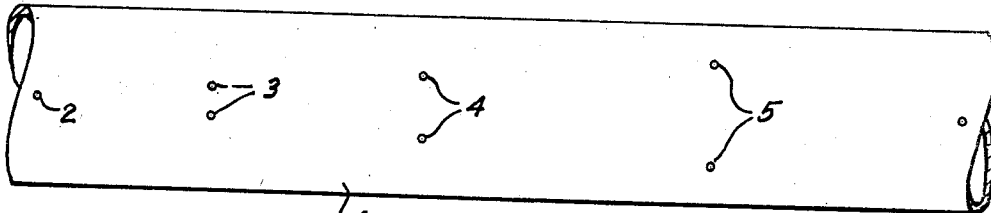


Fig. 7.

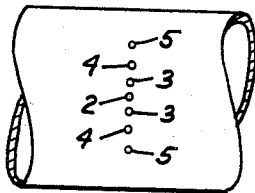


Fig. 5.

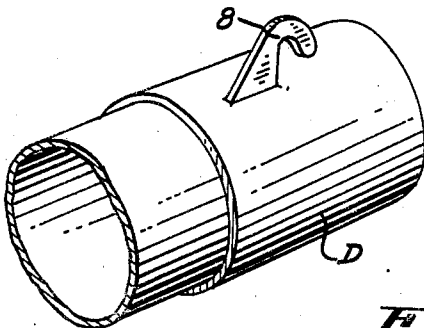


Fig. 4.

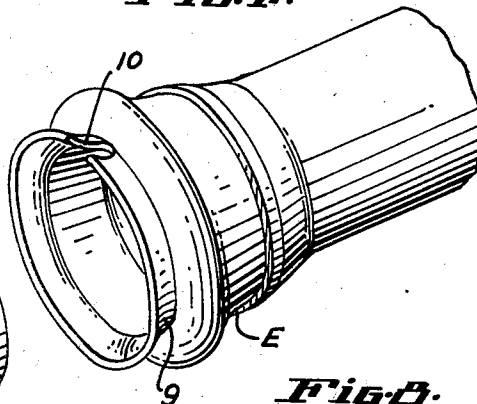


Fig. 3.

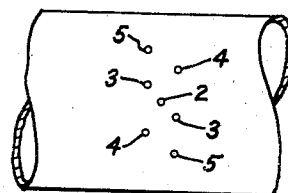
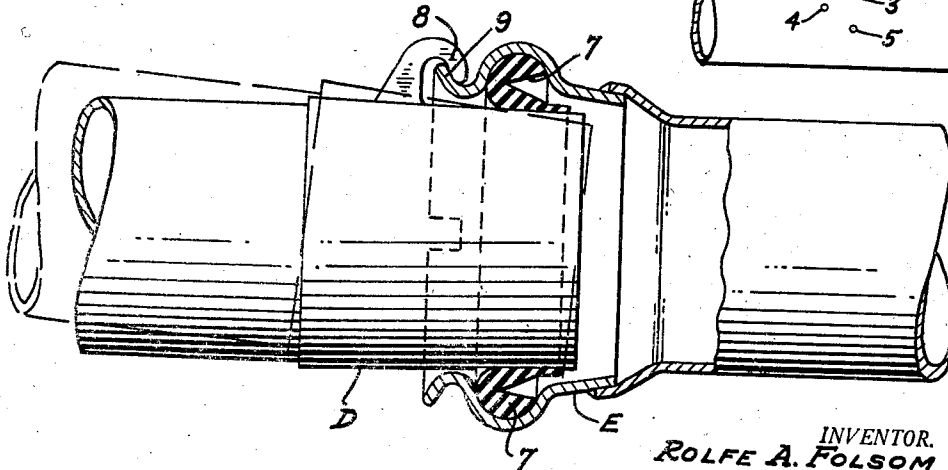


Fig. 6.



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2 Sheets-Sheet 2

Fig. 3.

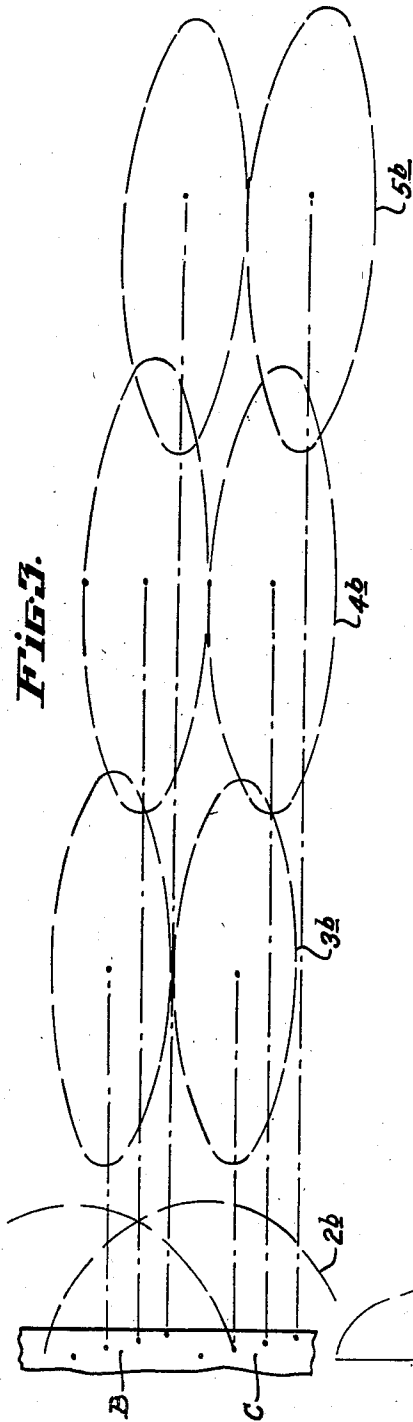
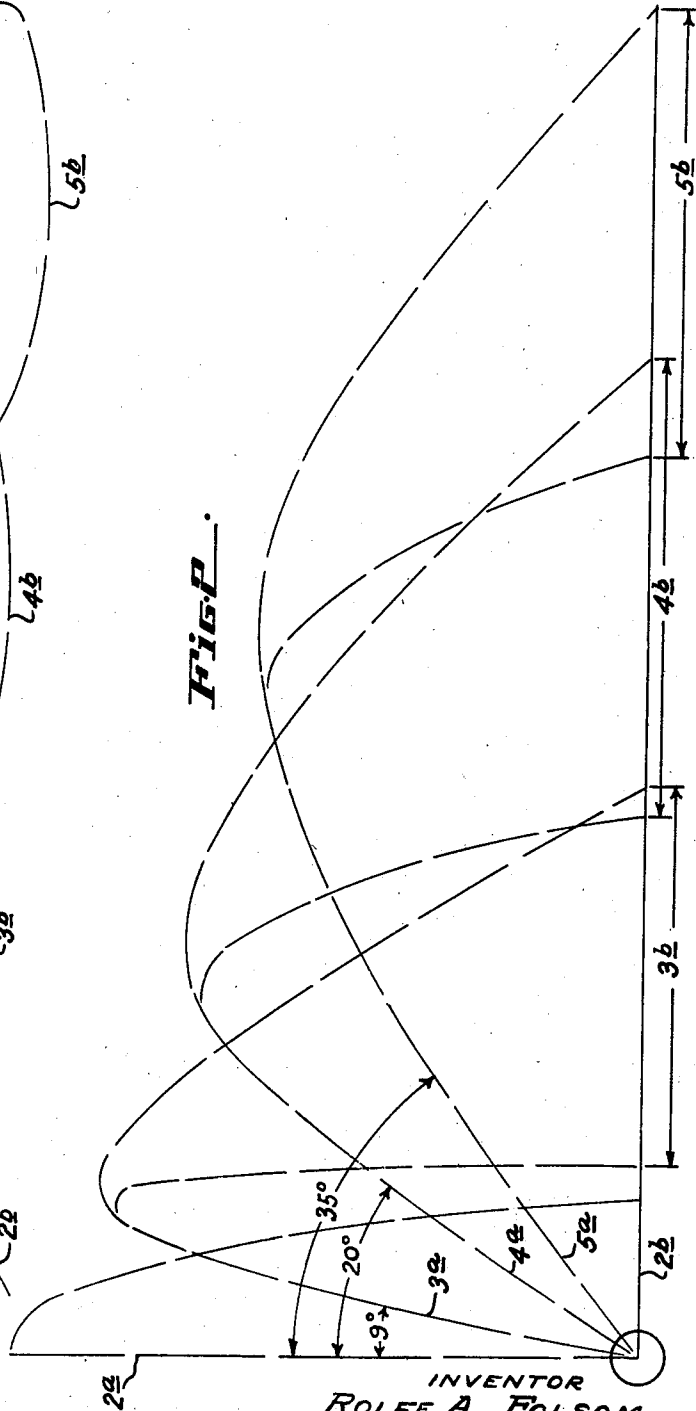


Fig. 4.



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UNITED STATES PATENT OFFICE

2,339,632

SPRINKLER PIPE

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corporation of California

Application November 14, 1941, Serial No. 419,051

2 Claims. (Cl. 299—19)

This invention relates to a perforated sprinkler pipe for applying water to crops in the form of rain.

The object of the present invention is generally to improve and simplify the construction and operation of sprinklers of the character described; to provide a sprinkler which will apply the water in the form of rain drops at low velocity; to provide a sprinkler in the form of a relatively large diameter pipe with respect to the volume of water used so that the pipe will function more or less as a storage tank or plenum and at the same time reduce longitudinal flow or velocity through the pipe to an absolute minimum; to provide a pipe of the character described which is perforated throughout its length and in which the perforations are so spaced and positioned that the jets issuing therefrom will break up into drops and provide an even application over a predetermined area; to provide perforations which will insure smooth solid jets to achieve maximum distance or spread before breaking up into drops; to provide perforations so arranged that jets will be projected at right angles to the longitudinal axis of the pipe both vertically and laterally; to provide a perforated sprinkler pipe that will operate efficiently under low pressures, as from 4 to 20 lbs., thereby reducing pumping cost and permitting the use of lightweight galvanized sheet iron pipe which may be readily handled and moved from place to place.

The invention is shown by way of illustration in the accompanying drawings, in which

Fig. 1 is a plan view of a section of the sprinkler pipe;

Fig. 2 is a plan view showing diagrammatically, the areas in which the water is spread during the sprinkling operation;

Fig. 3 is a diagrammatic end view further illustrating the spread of the water;

Fig. 4 is a perspective view of one end of a pipe coupling;

Fig. 5 is a perspective view of the opposite or cooperating end of the pipe coupling;

Fig. 6 is a sectional view showing the coupling members connected; and

Figs. 7 and 8 show modified arrangements of the perforations.

Referring to the drawings in detail and particularly Figs. 1 to 3, A indicates a pipe which is provided with spaced groups of perforations as indicated at B and C. The perforations in each group commence with a single perforation such as indicated at 3, 4 and 5. In one structure in

actual use the longitudinal spacing between the perforation 2 and the pair of perforations indicated at 3 is four and one half inches, the spacing between the perforations 3 and the pair indicated at 4 is five and one half inches and the spacing between the perforations 4 and the pair indicated at 5 is seven and one half inches and as the lateral spacing of each pair of perforations also increases, as plainly shown in Fig. 1, it may be said that the general shape or pattern presented by each group of perforations is V-shaped and that the spacing between the perforations in each group increases progressively both longitudinally of the pipe and crosswise thereof.

The perforation indicated at 2 is vertically disposed so as to project a jet of water vertical to the pipe as indicated at 2a, the perforations 3 are disposed on an angle of substantially 9°, the perforations 4 are disposed at an angle of substantially 20° and the perforations 5 on an angle of substantially 35°, and they project jets such as indicated at 3a, 4a and 5a. See Fig. 3. These angles have been found to be the most satisfactory, as a uniform distribution of water over the surface to be sprinkled or irrigated results. For instance, by referring to the diagrammatic views shown in Figs. 2 and 3, it will be noted that the vertical jets 2a issuing from the perforations 2 begin to break up into drops at the point of highest elevation and thereby spread out to cover a circular area such as indicated at 2b. The jets 3a issuing from the perforations 3 on an angle form an elliptical area 3b and similar areas 4b and 5b are formed by the jets 4a and 5a issuing from the perforations 4 and 5. Theoretically speaking, the areas indicated are the areas covered with water, but in actual practice the intermediate areas are also covered as there is always a slight weaving or swaying of the jets due to motion of the air even on a day when there appears to be no wind or air movement.

The type of pipe employed is galvanized sheet iron pipe of from 3" to 6" in diameter. It may be of light weight or gauge as the water pressure employed runs from as low as 4 lbs. gauge to a maximum of about 20 lbs. Under this pressure the spread on each side of the pipe will be from 10 to 20 ft. making a total coverage of 20 to 40 ft. throughout the length of the pipe. The perforations in the pipe are small, for instance, perforations $\frac{1}{8}$ " in diameter will apply water under the low pressures specified at the rate of approximately 2" per hour and a perforation $\frac{3}{64}$ " in diameter will apply water at the rate of 1" per hour. As the perforations are small in com-

parison to the diameter of the pipe which is from 3 to 6" in diameter, it is obvious that longitudinal velocity through a sprinkler pipe even of considerable length will be small thus permitting sand and other foreign matter to settle and to a great extent avoid clogging of the perforations. Floating material may temporarily close certain of the perforations but the flow or velocity of the water longitudinally of the pipe tends to remove or carry floating material along the pipe to the last section from where it may be flushed out from time to time. Hence, there is no tendency to clog either with sand or flotsam.

The sprinkler pipe here illustrated is intended to be laid directly on the ground to be irrigated or sprinkled and to remain there only long enough to apply the water required. The pipe which is furnished in suitable lengths is then uncoupled and moved to the next section or area to which the water is applied, hence it is essential that quick coupling or uncoupling of the pipe be permitted and that the pipe be of light weight so that one man may readily pick up a pipe section and carry or move it to the next position. A suitable form of pipe coupling is shown in Figs. 4 and 5. It consists of a tapered sleeve D welded on one end of a pipe. This sleeve is adapted to enter a coupling head E welded on the end of another pipe. A gasket 7 forms a water seal within the coupling and longitudinal removal of sleeve D is prevented by providing a hook 8 which is adapted to hook behind an annular flange 9 in coupling E. Only a brief description is submitted as the coupling illustrated is fully described in my former Patent No. 2,221,284 entitled "Pipe coupling" and issued November 12, 1940.

In actual practice, when the pipe is to be coupled, the end D, see Fig. 4, is inserted in the open end of the coupling E with the hook in registry with a notch 10 formed in the flange. When the hook passes through, the pipe is rotated, say a quarter revolution, and an interlock is thus formed between the coupling sections which will prevent longitudinal separation. Also, this ro-

tation of the pipe permits the pipe to be so positioned that all the vertical jets will project the water vertically, while the remaining jets will insure uniform spread of water at each side of the sprinkler pipe. The perforations are shown as arranged in a V shape extending longitudinally of the pipe. See Fig. 1 of the drawings. They may also be arranged in substantial line formation cross-wise of the pipe as shown in Fig. 7 or in a staggered formation cross-wise of the pipe as shown in Fig. 8 and while this and other features of my invention have been more or less specifically described for purposes of illustration, I nevertheless wish it understood that various changes may be resorted to within the scope of the appended claims, and that the materials and finish may be such as the experience of the manufacturer may dictate and varying conditions of use demand.

Having thus described and illustrated my invention, what I claim and desire to secure by Letters Patent is—

1. A sprinkler pipe having perforations formed in its crown and extending longitudinally thereof, said perforations being arranged in spaced groups, each group commencing with a single perforation adapted to project a vertical jet and followed by pairs of perforations of gradually increased spacing both cross-wise and longitudinally of the pipe, to throw jets laterally of the pipe at different angles.

2. A sprinkler pipe having perforations formed in its crown and extending longitudinally thereof, said perforations being arranged in spaced groups, each group commencing with a single perforation adapted to project a vertical jet and followed by three pairs of perforations of gradually increased spacing longitudinally of the pipe, the first pair of perforations being disposed on an angle of substantially 9° on opposite sides of the vertical jet, the second pair on an angle of substantially 20° and the third pair on an angle of substantially 35°.

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