

1,150,144.

J. A. NORTON.
IRRIGATING APPARATUS.
APPLICATION FILED MAR. 23, 1914.

Patented Aug. 17, 1915.

3 SHEETS—SHEET 1.

Fig. 1

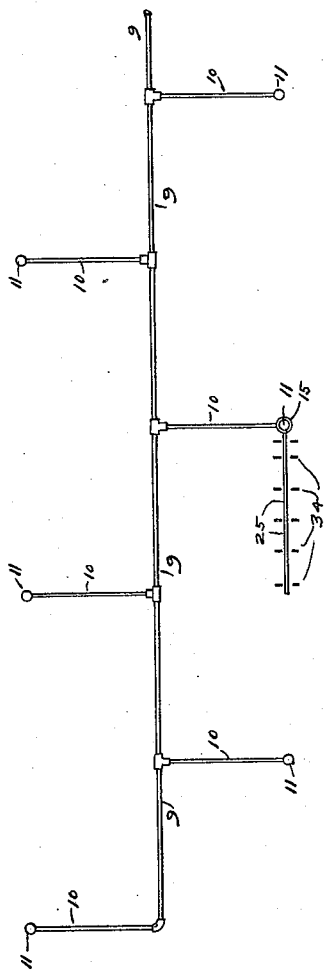
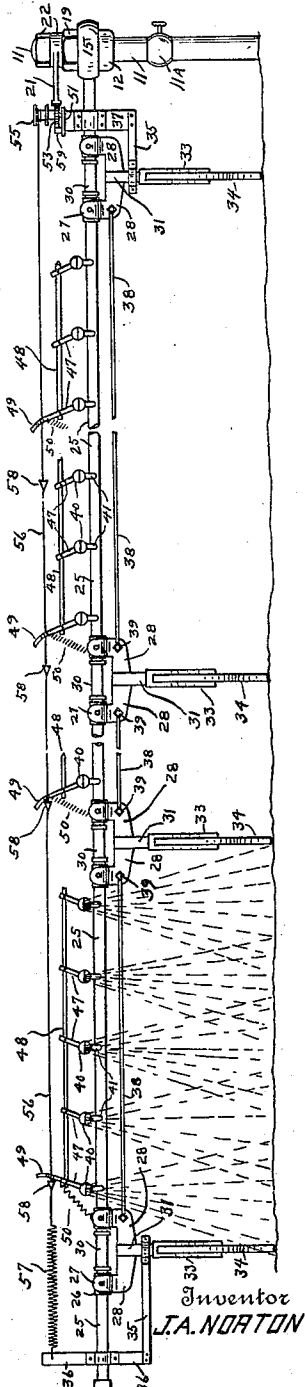


Fig. 2



Witnesses

Minerva Craudall

B. A. Walrath

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Milton S. Randall,

Attorney

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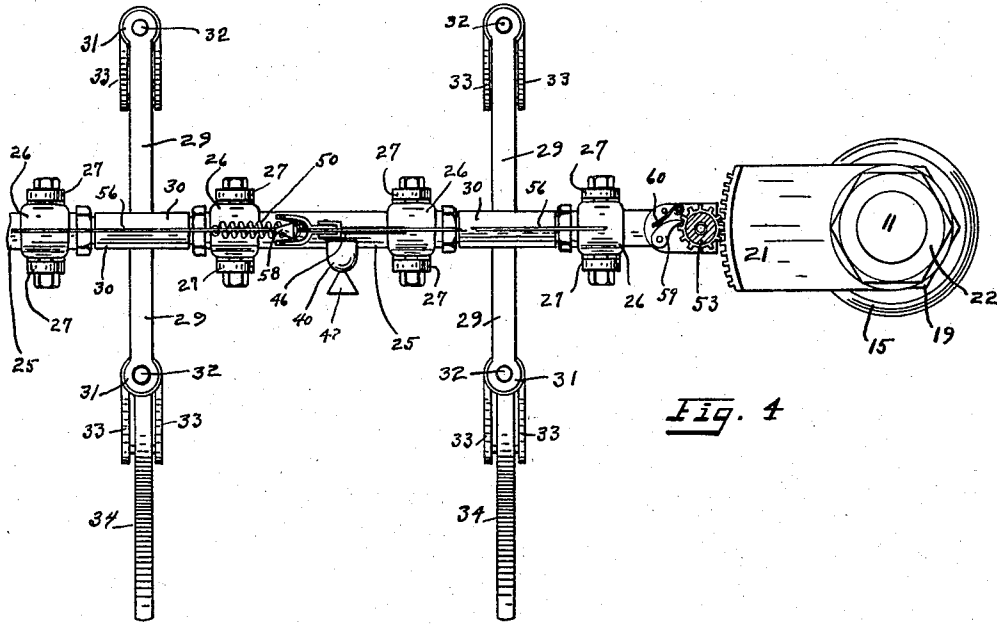


Fig. 4

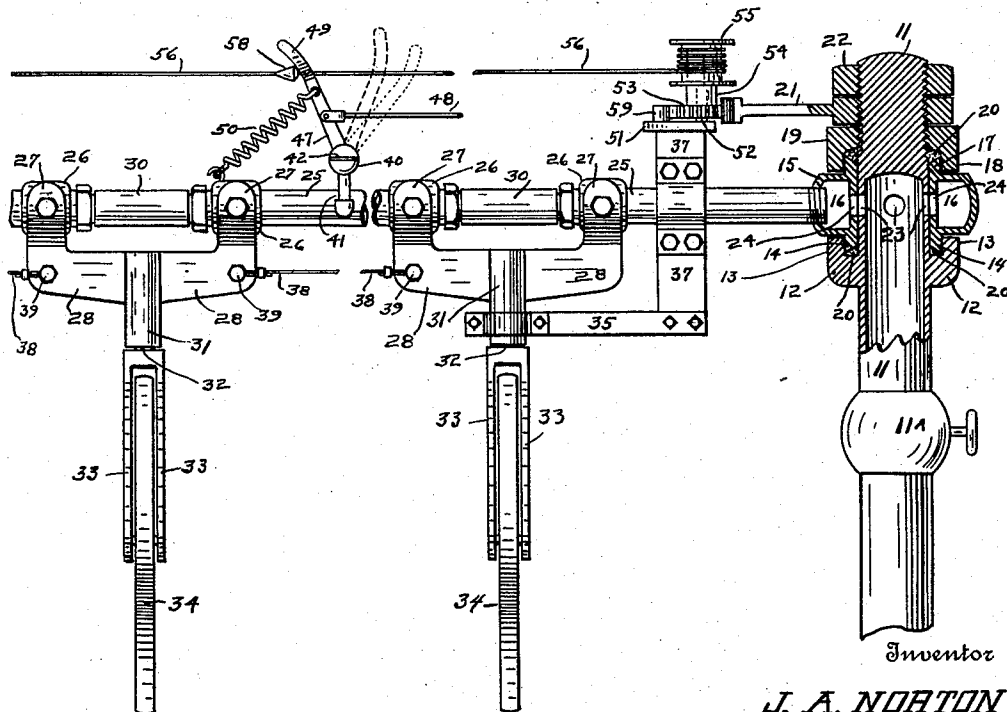


Fig. 3

Witnesses
Miner & Grandall

B. A. Waliath

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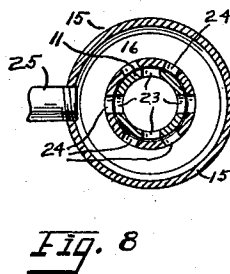
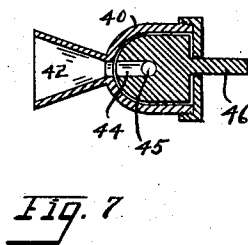
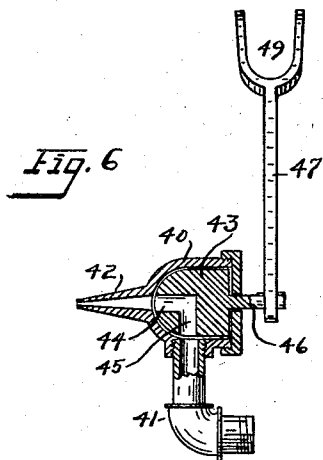
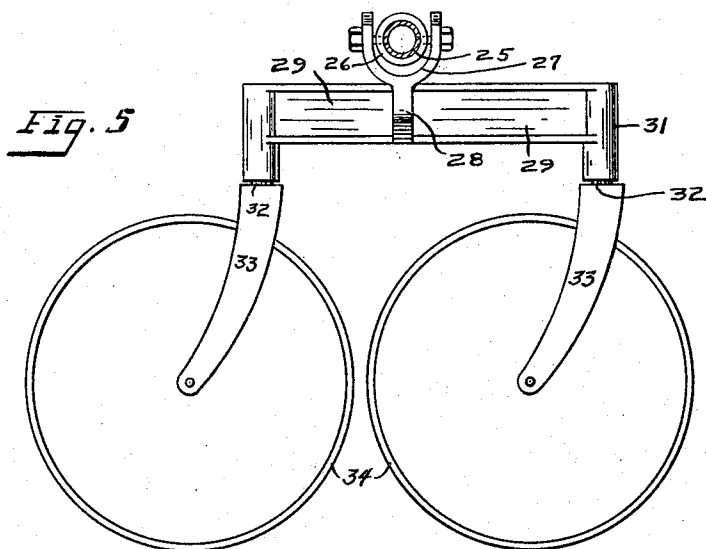
Inventor
J. A. NORTON

M. S. Grandall
Attorney

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3 SHEETS—SHEET 3.



Witnesses
Minerva Grandall
B. A. Walrath

By

Inventor
J. A. NORTON
Milton S. Grandall,
Attorney

UNITED STATES PATENT OFFICE.

JAMES A. NORTON, OF ODEBOLT, IOWA, ASSIGNOR TO LEE E. GRANT, OF IDAGROVE, IOWA.

IRRIGATING APPARATUS.

1,150,144.

Specification of Letters Patent.

Patented Aug. 17, 1915.

Application filed March 23, 1914. Serial No. 826,577.

To all whom it may concern:

Be it known that I, JAMES A. NORTON, a citizen of the United States, and a resident of Odebolt, in the county of Sac and State of Iowa, have invented certain new and useful Improvements in Irrigating Apparatus, of which the following is a specification.

The present invention relates to means for irrigating land.

10 The primary object of the invention is the production of improved means for distributing water uniformly over a field.

Another object is the construction of a portable device of this class which may be readily attached to and detached from a hydrant.

20 A further object of the invention is the production of an irrigating system wherein the water is sprayed from a wheeled duct disposed radially from and traveling around an upright water column from which the duct receives.

25 A still further object of the invention is the production of a device of this sort thoroughly reliable in operation yet wherein the cost of operation and construction is reduced to the minimum.

30 With these and several other objects in view, the invention, consisting in the construction, combination and novel arrangement of parts, will be fully understood from the following description, reference being had to the accompanying drawings which form a part of this application and in which like characters of reference indicate corresponding parts throughout the several views, of which—

35 Figure 1 is a diagrammatic plan view of an irrigating system constructed in accordance with my invention; Fig. 2 is an enlarged fragmentary elevation of the portable distributor; Fig. 3 is a detail elevation of one of the hydrants, partly in section and portions of the distributor associated therewith; Fig. 4 is a plan view of Fig. 3; Fig. 5 is a side elevation of one of the trucks; Fig. 6 is a vertical section of one of the valved spraying nozzles; Fig. 7 is a horizontal section of the same with associated members omitted; and Fig. 8 is a transverse section of the hydrant and hub rotating thereon.

40 I illustrate and describe herein the preferred embodiment of the invention, yet I would not be understood as being limited to the species selected for illustration for va-

rious modifications and alterations in the details of construction and arrangement of parts may be made without departing from the spirit or scope of the invention as defined in the claims hereunto appended.

60 The invention contemplates, broadly, mechanism comprising an upright member communicating with a source of water pressure; a wheeled water conductor radiating therefrom and adapted to travel therearound and communicate at all times therewith; automatically-controlled valved spraying members arranged at intervals along the said conductor; and means for operating the spraying members in sets, all of which will presently be made clear.

70 For the practical application of my device for the purpose of irrigating large fields, the installation of a water pipe line system is first essential. In Fig. 1 is presented a portion of a pipe system suitable for the purpose and comprising a main artery, 9, adapted to receive from a source of water pressure and provided with laterals, 10, terminating with outlets or hydrants, 11, provided with suitable valves, 11^a, (Fig. 3).

75 The hydrants are identical and a complete knowledge thereof may be had by reference to Figs. 3, 4 and 8. The uppermost end of the hydrant is closed and the intermediate portion is formed with a shoulder, 12, having an annular rim, 13, to encircle a rim, 14 of a casing, or hub, 15 having an annular chamber, 16, and free to rotate upon the hydrant. The hub is provided with an upper rim, 17, freely encircled by the depending rim, 18, of a collar, 19, threaded upon the hydrant. Intermediate the rims of the hub and the adjacent shoulder and collar of the hydrant is inserted packing, 20. The collar 19 is held firmly in place by a toothed segment, 21, and a lock-nut, 22, threaded upon the hydrant. The hydrant is provided with peripheral ports, 23, positioned to communicate with ports, 24, through the inner wall of the rotary casing. By reference to Fig. 8 it is clear the ports are so arranged that the rotary casing is at all times in communication with the hydrant.

80 Extending radially from the casing is a conductor which travels around the hydrant and is provided with spraying nozzles. In order to facilitate the practical operation of the device over rough or rolling ground it is essential that the conductor be flexible ver-

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tically. Therefore, the conductor illustrated is constructed of sections of pipe, 25, the ends of which are formed with bosses, 26, pivoted within upwardly-extending forks, 27, formed on the ends of oppositely disposed arms, 28, extending laterally from beams, 29, arranged transversely of the conductor. The pipe sections are interconnected by hose, or flexible tubing, 30. The ends of the beams are provided with bearings, 31, which freely encircle the shanks, 32, of forks, 33, between which rotate the supporting wheels, 34.

The trucks may be maintained in upright position and in relative alinement by any suitable means, as by rigidly securing the outer and inner trucks to the conductor by braces, 35 firmly secured to the bearings 31 and uprights, 36 and 37, respectively, both firmly clamped upon the pipes; and interconnecting the trucks by links, 38, pivotally secured to the arms 28, as at 39.

From the structure now disclosed it is clear that the conductor is vertically flexible and thus adapted for travel over an irregular surface. Inasmuch as the radial conductor is of comparatively great length it would be impracticable to feed all the spraying members simultaneously; therefore, I prefer to arrange the nozzles in sets, as illustrated, each set being identified with a section of the conductor and controlled in any suitable manner. In the form chosen for illustration the valves are automatically controlled, the sets being operated successively as the conductor revolves around the hydrant. The valves comprise an outer casing, 40, (Figs. 6 and 7) connected with the pipes by fittings, 41, and provided with flattened nozzles, 42, adapted to emit the water in sheets. Within the casing is a rotatable valve head, 43, having intersecting ports, 44 and 45, the former being in constant communication with the nozzle and the latter adapted to register with the induction passage, 41. The valve heads are provided with stems, 46, having keyed thereon upwardly-disposed levers, 47, pivotally-secured to a connecting rod, 48. One lever of each set serves as the master lever, is extended and bifurcated to form a fork, 49. A retractable spring, 50, the terminals of which are secured, respectively, to the master lever and pipe, serves to hold the valves normally closed. The upright, 37, supports a plate, 51, having an upright spindle, 52, thereon, upon which rotates a pinion, 53, adapted for engagement with the toothed segment, 21, and carrying a block, 54, upon which is mounted a spool, or reel, 55, having wound thereon a portion of a wire, or strand, 58, connected by a retractable link, as the spring, 57, with the upright, 36, and supported by the forks 49. At suitable intervals the valve-controlling strand is provided

with bosses, 58, adapted to engage the master levers. The bosses are conically-shaped and thereby adapted to pass freely through the forks when the strand is retracted, as will presently appear.

In the practical operation of the device the pinion and fixed segment cooperate to turn the reel and impart traction upon the strand, whereupon the outermost set of valves is opened. A dog, 59, pivoted upon the plate 51, is held by a torsion spring, 60, in yieldable engagement with, and prevents retrograde movement of the pinion. The radial conductor will make a complete revolution around the hydrant with the outer set of valves open, and when the pinion is again actuated by the segment, traction upon the strand will cause the engaged boss to be drawn through the fork and permit the valve levers to be retracted; and, coincident with the release of the valves, the succeeding set will be opened by action of the boss associated therewith. The valve sets are thus successively operated until the entire radius has been watered. The dog, 60, may then be disengaged and permit the controlling link, 56, to be restored to normal.

The device may be propelled or drawn in any suitable manner; and the novel construction renders it capable of being readily coupled with and uncoupled from the hydrants and conveniently moved from place to place.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States, is,—

1. A device of the class described comprising a column adapted to receive water pressure; an elongated wheeled water conductor disposed radially thereto and adapted to travel thereabout and communicate at all times therewith; sets of spraying members arranged successively along and communicating with said conductor, said spraying members including nozzles, valves and their controlling means; and means controlled by travel of said conductor for governing said valve controlling means.

2. A device of the class described comprising a column adapted to receive water pressure; an elongated wheeled water conductor disposed radially thereto and adapted to travel thereabout and communicate therewith at all times; sets of spraying members arranged successively along and communicating with said conductor, said spraying members including nozzles, valves and their controlling means, said controlling means being movable to one position to close the valves and to another position to open them; yieldable means for holding said controlling means of each set normally in one of said positions; and means governed by travel of said conductor for moving said controlling means to the other of said positions.

3. A device of the class described comprising a column adapted to receive water pressure; an elongated wheeled water conductor disposed radially thereto and adapted to travel thereabout and communicate therewith at all times; sets of spraying members arranged successively along and communicating with said conductor, said spraying members including nozzles, valves and their controlling means, said controlling means being movable to one position to close the valves and to another position to open them; yieldable means for holding the controlling means of each set normally in one of said positions; an elongated armed member movable longitudinally of said conductor and adapted, when moved in one direction, to successively engage and move the controlling means to the other of said positions; and means controlled by travel of the conductor for moving said elongated member.

4. A device of the class described comprising a column adapted to receive water pressure; an elongated wheeled water conductor disposed radially thereto and adapted to travel thereabout and communicate at all times therewith; sets of spraying members arranged successively along and communicating with said conductor, said spraying members including nozzles, valves and controlling arms therefor, said controlling arms being movable to one position to close the valves and to another position to open them; yieldable means for holding the controlling arms of each set normally in one of said positions; a rotatable member mounted adjacent one end of said conductor; means carried by said column to engage and cause actuation of said rotatable member during portions of the travel of said conductor; and a flexible link armed with bosses and having one end yieldably secured to the end portion of the conductor opposite from said rotatable member, and the opposite end of said link having a portion wound upon said rotatable member, whereby actuation of the latter member will impart traction upon the link and cause said bosses to successively engage and move the controlling arms to the other of said positions.

5. A device of the class described comprising a column adapted to receive water pressure; an elongated water conductor disposed radially thereto and adapted to communicate at all times therewith, said conductor comprising sections of pipe and flexible tubular connections between said sections; castor-wheeled trucks each having upwardly-extending members to embrace and pivotally-support opposite sides of contiguous ends of adjacent pipe sections, whereby the

conductor is rigid horizontally and flexible in a vertical plane; sets of spraying members arranged successively along and communicating with said conductor, said spraying members including nozzles, valves and their controlling means, said controlling means being movable to one position to close the valves and to another position to open them; yieldable means for holding the controlling means of each set normally in one of said positions; an elongated armed member movable longitudinally of said conductor and adapted, when moved in one direction, to successively engage and move the controlling means to the other of said positions; and means controlled by travel of the conductor for moving said elongated member.

6. A device of the class described comprising a column adapted to receive water pressure; an elongated water conductor disposed radially thereto and adapted to communicate at all times therewith, said conductor comprising sections of pipe and flexible tubular connections between said sections; castor-wheeled trucks each having upwardly-extending members to embrace and pivotally-support opposite sides of contiguous ends of adjacent pipe sections, whereby the conductor is rigid horizontally and flexible in a vertical plane; sets of spraying members arranged successively along and communicating with said conductor, said spraying members including nozzles, valves and controlling arms therefor, said controlling arms being movable to one position to close the valves and to another position to open them; yieldable means for holding the controlling arms of each set normally in one of said positions; a rotatable member mounted adjacent one end of said conductor; means carried by said column to engage and cause actuation of said rotatable member during portions of the travel of said conductor; and a flexible link armed with bosses and having one end yieldably secured to the end portion of the conductor opposite from said rotatable member, and the opposite end of said link having a portion wound upon said rotatable member, whereby actuation of the latter member will impart traction upon the link and cause said bosses to successively engage and move the controlling arms to the other of said positions.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

JAMES A. NORTON.

Witnesses:

M. G. CRANDALL,
HELEN GARLOCK.