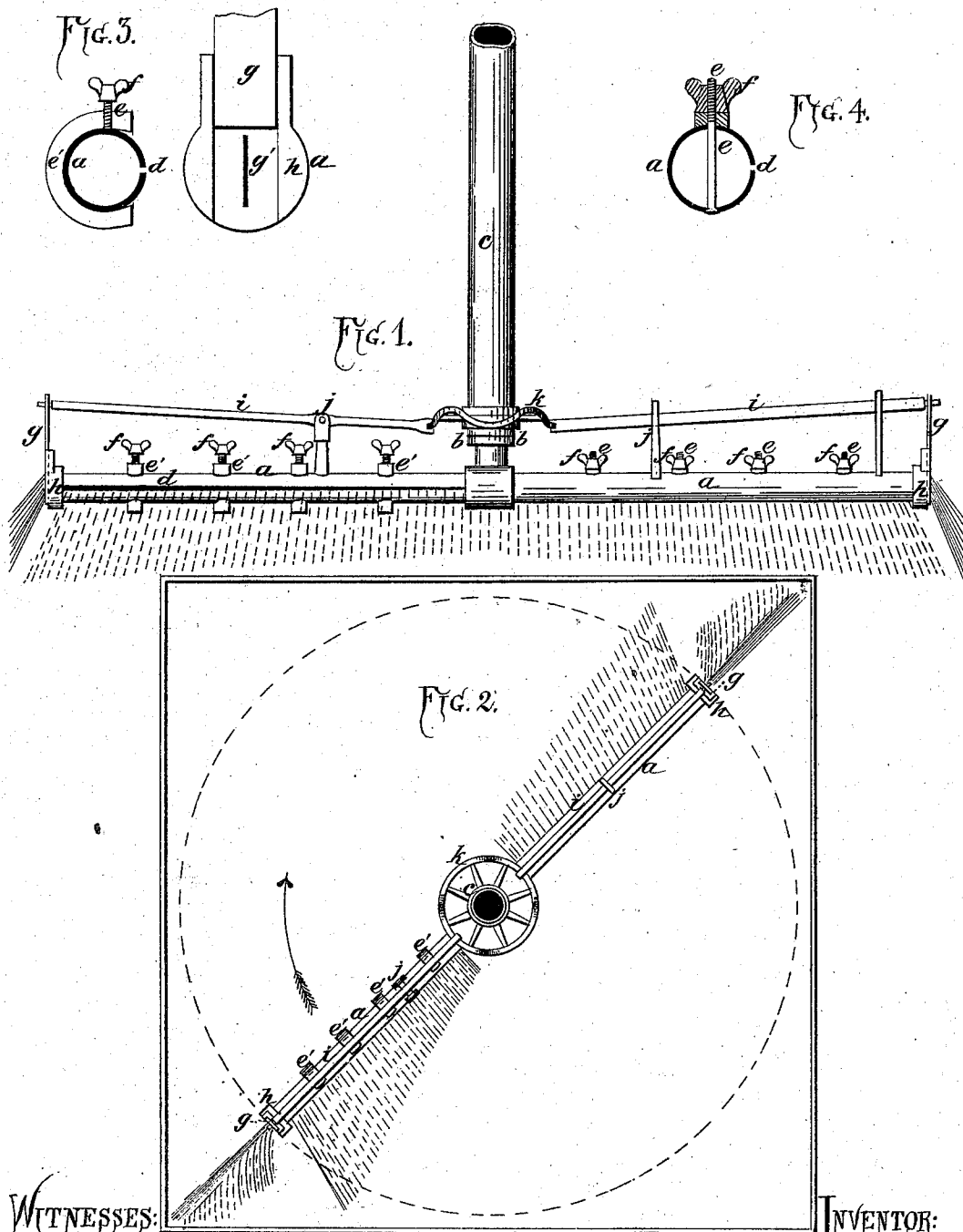


H. McKENZIE.

Sprinklers for Leaching Apparatus.

No. 150,595.

Patented May 5, 1874.



WITNESSES:
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UNITED STATES PATENT OFFICE.

HENRY MCKENZIE, OF MARQUETTE, MICHIGAN.

IMPROVEMENT IN SPRINKLERS FOR LEACHING APPARATUS.

Specification forming part of Letters Patent No. **150,595**, dated May 5, 1874; application filed May 1, 1874.

To all whom it may concern:

Be it known that I, HENRY MCKENZIE, of the city of Marquette, in the county of Marquette and State of Michigan, have invented certain new and useful Improvements in Automatic Sprinkler for Leaching; and I do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

The object of my invention is to provide an apparatus for the automatic distribution of fluids for leaching, and to render such distribution uniform over the surface of the material; while at the same time providing means for regulating the quantity of the fluid so distributed without decreasing the head pressure, velocity of flow, or speed of the distributing apparatus, and to render such distribution of the fluids uniform without regard to the shape of the leaching-vessel. These are the distinctive features of my invention, which consists in laying the fluid in a thin unbroken sheet, increasing in quantity in proportion to its distance from the axis of rotation, by means of fissures made in the opposite sides of the distributing-arms, and increasing in width toward their outer ends, while the outlet capacity of these distributors can be increased or diminished, and the volume thereby regulated without any change in the pressure, the velocity of the discharge, or in speed of the apparatus. My invention also consists in the combination, with automatic-distributing arms, of automatic gates or valves at the ends thereof, operating to open vents or fissures, at stated intervals during the revolving motion of the arms, for the purpose of projecting the fluid over an increased area of the leaching-vessel, such as the spaces formed by the corners of a square or many-sided vessel, and in this way effect an equal distribution of the water or fluid over the whole surface of the material without regard to the shape of the tub; the opening of the gates being, of course, governed by the shape of the tub, and the means for effecting their opening being also made to conform to said movement of the gates.

In the accompanying drawings, Figure 1 represents an elevation of a sprinkler for leaching, embracing my invention; Fig. 2, a plan thereof, showing the application to a square tub; Fig. 3, an end view; and Fig. 4, a cross-section.

The sprinkler consists of two revolving hollow arms, *a*, of thin metal, suspended by a loose joint, *b*, from a fixed conduit, *c*, leading from the head or reservoir. These arms extend equidistant from the conduit, and are split to form narrow openings or fissures *d d* on opposite sides, from which the fluid issues in thin sheets, and by its reaction causes the arms to revolve, discharging the leaching-fluid into the tub; and in order that this discharge may be uniform, and in proportion to the increasing area of the tub from the center, these fissures are made to gradually increase in width from the conduit to the ends of the arms, as shown in Fig. 1. To increase or diminish the width of the distributing-fissures I employ adjusting-screws *e*, passing vertically through the hollow arms, being riveted therein at their lower ends, and provided with thumb-nuts *f* at their upper projecting ends, so as to bear upon the upper section of the split tube, and draw the sections together, or allow them to open as the nuts *f* are turned, the arms for that purpose having sufficient spring. These adjusting-screws *e* are arranged at such intervals as to effect the desired width of the discharging-fissures. Instead of having the adjusting-screws to pass through the arms, they may be embraced by yokes *e'*, through the upper ends of which the screws *e* pass, so as to bear upon the upper side of the arms. By this means the fluid sheet is increased or diminished in thickness or volume uninterruptedly from the center to the extremities of the arms, and the material is thereby evenly and uniformly sprayed in proportion to its increased bulk from the center of the tub, which is a matter of vital importance, to effect a uniform degree of leaching by percolation. In connection with the automatic continuous distribution of the fluid from the arms, I also employ gates or valves *g* at the ends thereof, which are operated automatically at stated intervals to open fissures or jets to project sheets or streams of the fluid from the ends of the arms to sprinkle the an-

gular spaces formed by square or many-sided tubs. These end streams may be projected in the line of the arms or obliquely thereto, and the gates may be arranged to work in the ends of the arms in any suitable way to accomplish this purpose. In the drawings they are arranged to slide vertically in guides formed in heads *h*, on the ends of the pipes, and to open and close the end fissures *g'* by means of levers *i*, connected with said gates, pivoted to short posts *j* on the arms, and connected to and operated by a serpentine cam, *K*, fixed to the lower end of the conduit, so that the revolving motion of the arms will carry the inner ends of the levers over the cam, and thereby cause the vibration of the levers, and the automatic opening and closing of the end gates.

The sinuosities of the cam must, of course, be made to conform to the frequency with which the gates are desired to be opened.

My improved sprinkler is by its construction adapted for use with either round or square tubs, the only requirement for such change being the removal or attachment of the valve-operating levers, as with round tubs the valves serve as closed ends to the arms.

I claim—

1. A sprinkler, for use in leaching, having its discharge adjustable throughout the length of the arm for regulating the sheet-flow.

2. A sprinkler for leaching, having the revolving arms *a*, split to form fissures *d*, extending uninterruptedly in gradually-increasing width from the center of motion, substantially as described, whereby the fluid is distributed uniformly without decreasing the head-pressure, velocity of flow, or speed of the distributing apparatus, substantially as described.

3. The split distributing-arms *a*, in combination with the adjusting-screws *e*, substantially as described, whereby the discharging-fissures may be increased or diminished in width, to increase or diminish the volume of discharge.

4. The combination of automatic distributing-arms *a* with automatically-operating end gates or valves *g*, whereby the distributing-arms may be adapted to sprinkle square tubs.

5. The combination of the automatic distributing arms *a* and the automatic opening and closing end gates *g* with the levers *i*, and their operating device *h*, carried by the fixed conduit *c*, substantially as described.

In testimony that I claim the foregoing as my own, I affix my signature in presence of two witnesses.

HENRY McKENZIE.

Witnesses:

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J. W. HAMILTON JOHNSON.