(No Model.) 2 Sheets—Sheet 1.

C. M. COLLINS.

SPRINKLER.

No. 381,986. Patented May 1, 1888.

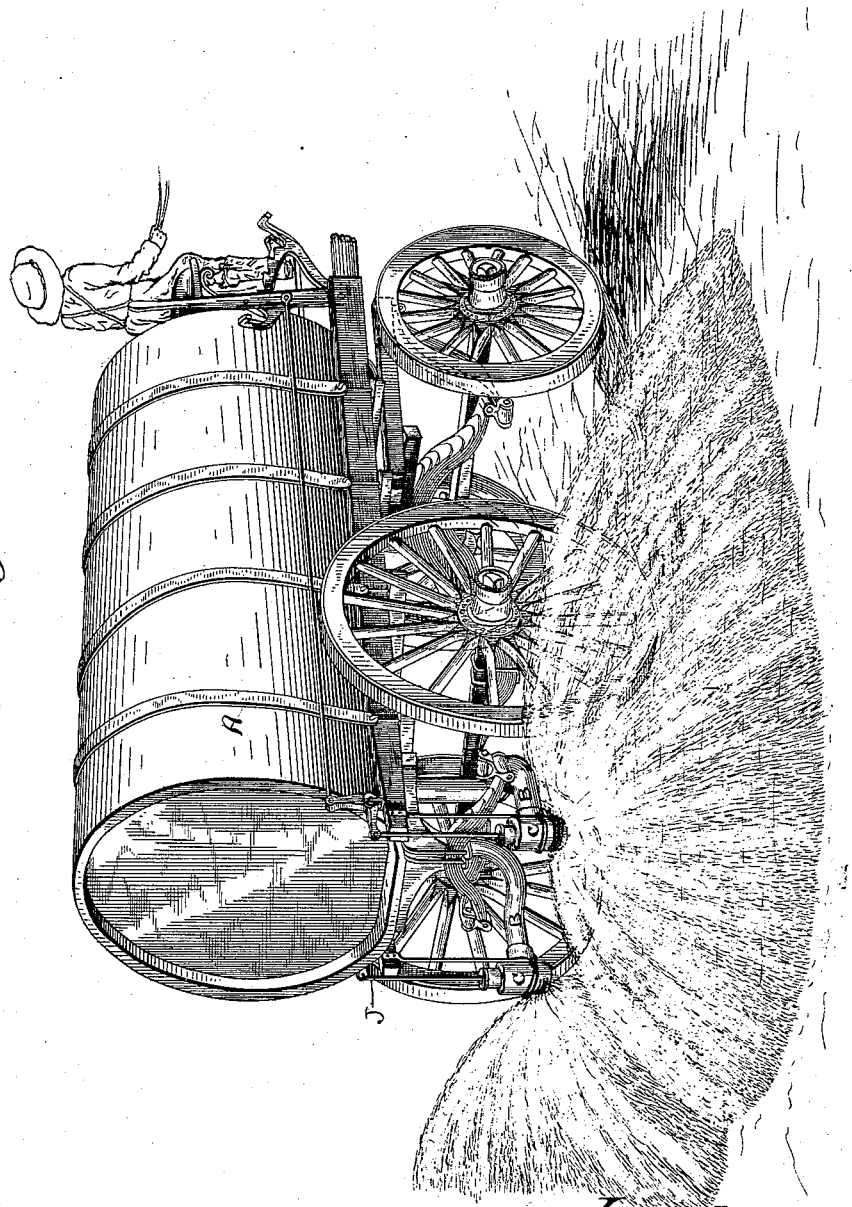

Fig. 1.

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(No Model.) 2 Sheets—Sheet 2.

C. M. COLLINS.

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Fig. 2.

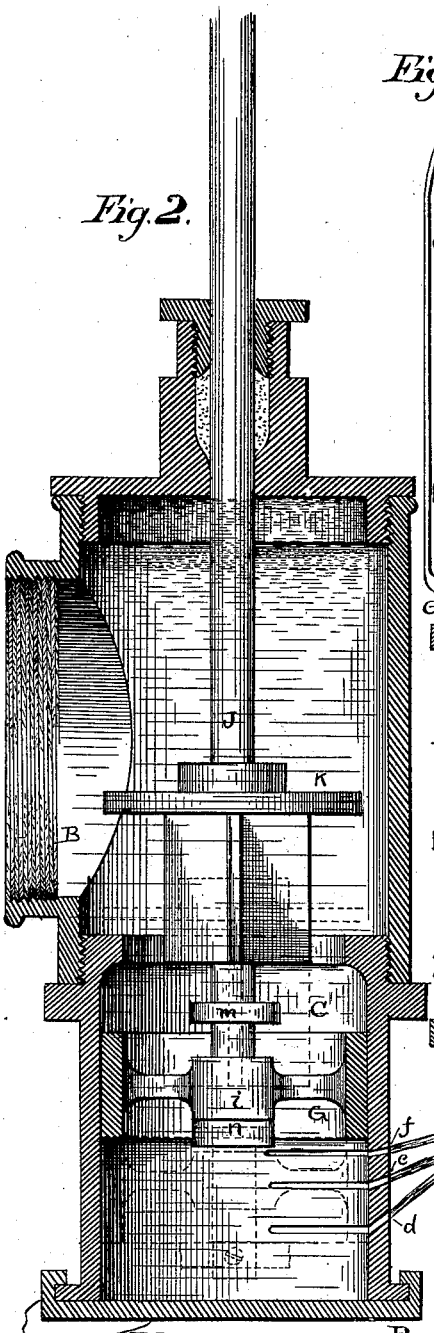


Fig. 4.

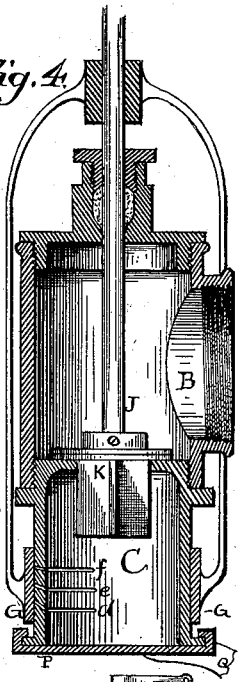


Fig. 3.

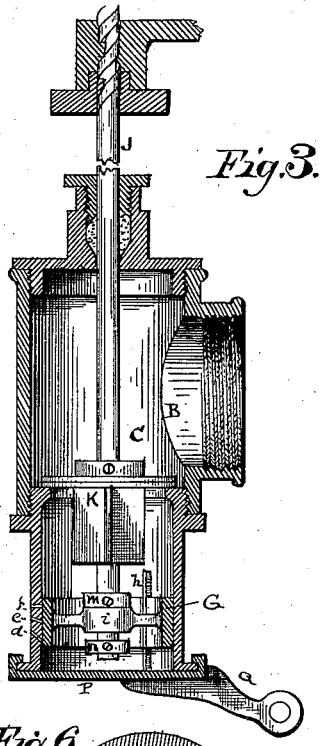


Fig. 5.

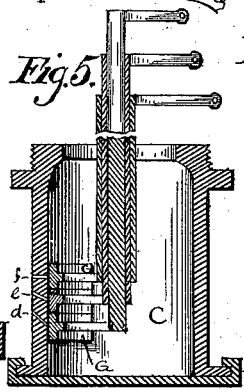


Fig. 6.

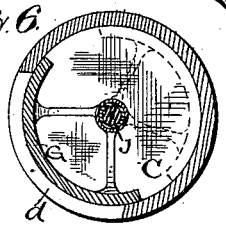
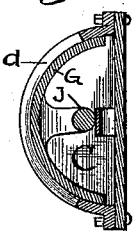


Fig. 7.



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UNITED STATES PATENT OFFICE.

CHARLES M. COLLINS, OF SOUTH BEND, INDIANA.

SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 381,986, dated May 1, 1888.

Application filed September 5, 1887. Serial No. 248,823. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. COLLINS, of South Bend, in the county of St. Joseph and State of Indiana, have invented new and useful Improvements in Sprinklers; and I do hereby declare that the following is a full, clear, and accurate description of the same.

This invention is particularly adapted to road and street sprinklers, but may be used for other purposes. For convenience and by way of illustration I show it applied to a sprinkling cart or wagon without designing to limit the employment of the invention to that use.

For the purpose of sprinkling streets it is desirable to spread the water in a copious shower as evenly as possible and over the widest possible area, and it is desired to provide a sprinkler which will accomplish this object under low pressure, because the maximum pressure attainable with a sprinkling-cart does not exceed that due to a head of about four feet, and from that head it runs down to, say, one foot.

It is well understood that the maximum power of water in motion is attained when the stream proceeds from its source to the place of work with the least possible agitation and fewest deflections, because every change of direction and every internal agitation—as in dashing about in a reservoir—consumes power in friction and internal work and deducts from ultimate useful effect. This physical fact applies particularly to street-sprinklers, because the desired effect is the farthest possible projection of the water from the sprinkler, and because it is desired to work effectively under very small pressures. It is therefore important to convey the water in a large stream with low velocity to the place of final issuance, and then to cause it to issue without deflection from the supply behind the jet-orifice directly in the direction of desired projection. Heretofore, so far as I am aware, sprinklers of this class have caused the water to issue from the place of supply not in the direction of desired projection into the air, but oblique thereto and in contact with a deflecting-surface, by which the issuing water is directed to the desired course as it escapes into the air. Frequently it is desirable, also, to temporarily and quickly reduce or augment the quantity discharged, and to do this while the wagon or cart is in motion. So far as I am aware this has not heretofore been done.

The statements above indicate the nature of my invention.

In the accompanying drawings, Figure 1 is a perspective view of a watering-wagon having my invention attached. Fig. 2 is a vertical central section of my sprinkler. Figs. 3, 4, 5, 6, and 7 are modifications of the same.

A is the tank or reservoir from which water is drawn. When used for a street-sprinkler, it will represent the tank mounted on wheels in the ordinary way; but when the sprinkler is stationary A may represent a general reservoir or a hydraulic machine. From the source A water is conveyed in a main, B, to the chamber C, and the main B ought to be of larger cross-sectional area than the combined areas of the orifices through which the water escapes, so that the water will flow to said chamber with a less velocity than the velocity of issuance, and in that way the issuing water will be impelled by maximum pressure. As it issues from said chamber through the orifices *d e f*, &c., in the direction of desired projection and without deflection, it follows that the projection will be to the greatest attainable distance.

The orifices *d e f* may be circular perforations; but to reduce frictional surface in said orifices I prefer to make them in the form of slots and to cause the water to issue in one or more spouting sheets which will quickly break up into drops and fall upon the ground in a shower evenly distributed along a curved line about the same distance at all places from the sprinkler. I prefer, also, to arrange said orifices in parallel series, as shown, so that one or more sheets shall issue, and thereby the quantity discharged will vary accordingly. I also prefer to vary the angles of issuance as between the series, substantially as shown, so that before reaching the ground the several sheets will unite. This, however, is not essential.

To control the escape of water by way of the orifices *d e f*, I place within the chamber C a sliding valve, G, which, when at one end of its stroke, covers all of said orifices, and

from that position may be moved to successively uncover the several series *d e f*, as set forth.

As it is most convenient to make the chamber C cylindrical, the valve G will be in the form of a cylindrical ring, as shown in Fig. 2; but that is only a matter of convenience. It may be in any other form which for any reason may be desired. The outer surface or face of the valve G may be covered with some suitable packing material, if desired, and said valve may be confined on its seat by any convenient and suitable means. When the valve is cylindrical, it may be made of elastic metal in diameter a very little larger than the chamber C, and, being slit open longitudinally on one side, it will expand as the face wears away and remain always tight. To prevent any rotation of the valve G, a rib or stud, *h*, is placed between the ends, or in a slot in said valve.

The valve G is provided with a stud or spider and an axial hub, *i*, through which the axial valve-stem J extends. At the top of chamber C said valve-stem passes through a stuffing-box, and at a convenient point above said stem is coupled with mechanism convenient to the hand or foot of the driver, to enable him to open or close the valve G at pleasure.

It is advantageous to provide a puppet or other valve, K, within the chamber C, to insure against leakage through the slide-valve G, and I place said valve K on the stem J. I then let said stem pass loosely through the hub *i*, with its range of motion limited by collars *m n*, one or both of which may be adjustable. The effect of this is to cause the valve K to open and the chamber C to fill with water under pressure before the escape-orifices *d* are uncovered, and thereby the first gush of escaping water will be under full pressure instead of commencing at a mere flow until pressure has accumulated by filling up the chamber.

The stem J may be moved by a direct pull, being coupled to a bell-crank to be actuated by the hand or foot of the driver; or it may be moved by rotation, as shown in Fig. 3, a screw of long pitch being cut in the stem J and a corresponding female screw being provided to engage therewith.

It is immaterial whether the valve-stem is rotated by a crank or whether the valve stem is restrained from rotation, and the female screw constitutes a rotating nut with a lever-handle actuated by the driver.

In Fig. 4 the valve ring G is shown upon the outside as a modified structure having some advantages.

In Figs. 5 and 6 the valve G is shown as a horizontally-rotating valve instead of a slide-valve, and the valve is also shown divided horizontally to cover the several ports or slots separately. In that case the valve-stems of all except one are tubular, one stem passing through another, as shown in Figs. 5 and 6. At the top all said tubular stems are provided with individual cranks, so that one of said valves may be moved independently of the others.

The slots *d e f* extend about half-way around the cylinder, or less for street-sprinkling purposes, and it is therefore possible to make the chamber C with a flat back, as shown in Fig. 7.

The end of the chamber C is closed by a cap, P, which is secured in place by a bayonet-joint, and is provided with a lever-handle, Q, or other sufficient device, to enable the attendant to remove said cap easily whenever it is desired to do so.

Having described my invention, I claim—

1. In a sprinkler, the chamber C, provided with the orifices *d e f*, arranged at different distances from the end of the chamber in parallel lines and oblique to the axis of said cylinder, and pierced at different angles of obliquity converging toward a point or line upon the outside of said chamber, as and for the purpose set forth.

2. In a sprinkler, the upright chamber C, provided with the jet-openings *d e f*, consisting of horizontal slits arranged at different distances from the end of the chamber in parallel lines, combined with a valve, G, actuated by a proper valve stem parallel with the axis of the chamber, whereby one or more of said openings may be opened or closed at will.

3. In a sprinkler, the chamber C, provided with jet-openings arranged at different distances from the end of the chamber, combined with a slide or rotating valve, G, a puppet-valve, K, and a valve-stem, J, with mechanism to operate the same from the outside of said chamber.

4. In a sprinkler, the chamber C, provided with the jet-openings *d e f*, arranged at different distances from the end of the chamber, a valve-stem, J, a puppet-valve, K, rigidly attached thereto, and a valve, G, loosely attached to said stem, so that the valve K will be actuated in advance of the movement of said slide-valve, as set forth.

5. In a sprinkler, the cylindrical chamber C, having the jet-openings *d e f*, arranged in parallel lines, combined with the spring-valve G, of elastic metal, longitudinally divided and of normally greater diameter than the interior of said chamber, whereby by elastic expansion the valve will compensate wear, said valve being adapted to reciprocate longitudinally of the chamber and provided with a valve-stem parallel with the axis of the chamber, as set forth.

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