(No Model.)

S. S. BLACK.

LAWN SPRINKLER.

No. 505,086. Patented Sept. 19, 1893.

Fig. 1.

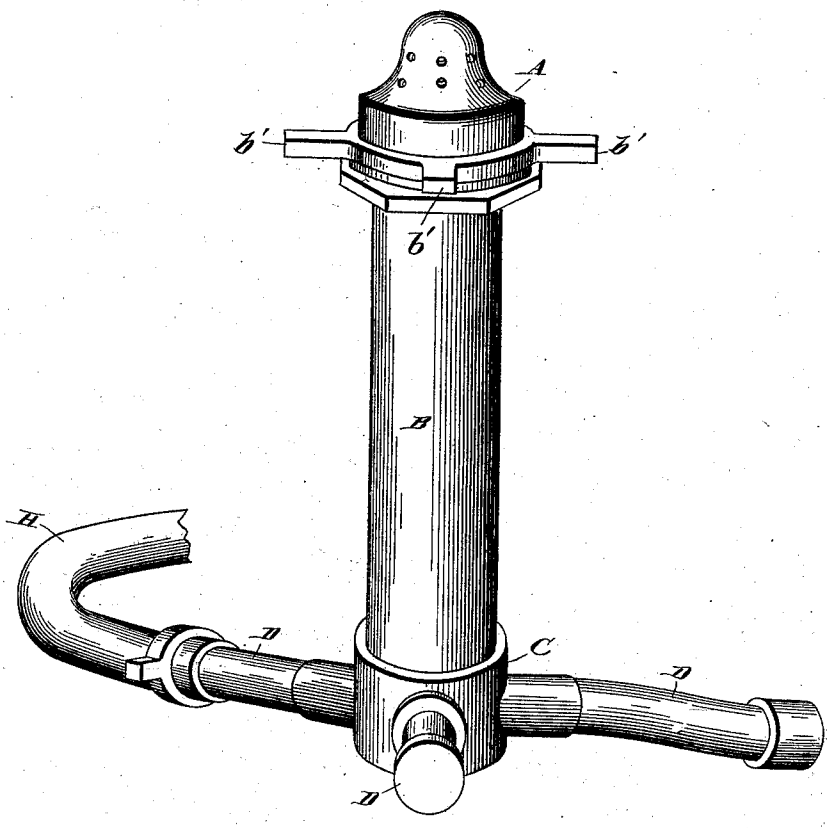
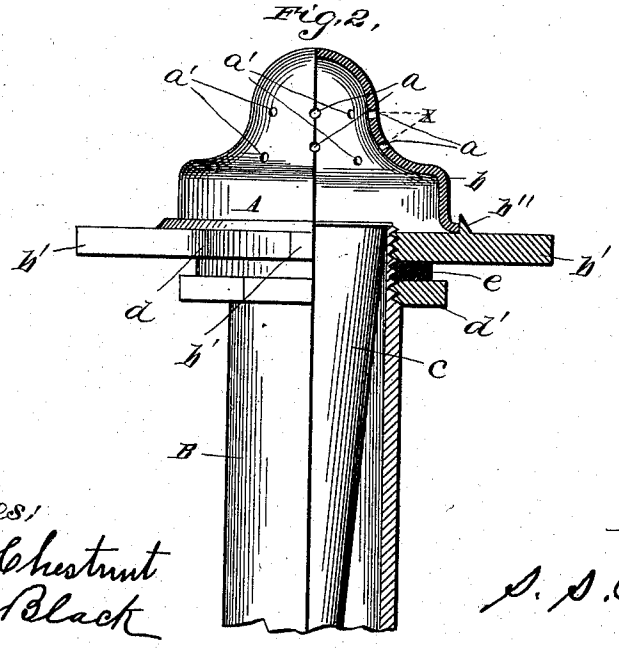


Fig. 2.



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UNITED STATES PATENT OFFICE.

STEPHEN S. BLACK, OF PASADENA, CALIFORNIA.

LAWN-SPRINKLER.

SPECIFICATION forming part of Letters Patent No. 505,086, dated September 19, 1893.

Application filed June 15, 1891. Serial No. 396,402. (No model.)

To all whom it may concern:

Be it known that I, STEPHEN S. BLACK, a citizen of the United States, residing at Pasadena, in the county of Los Angeles and State of California, have invented a new and useful Lawn-Sprinkler, for which I desire to secure Letters Patent, and of which the following is a clear and exact specification, from which any skillful workman will be able to construct an instrument having the same qualities.

My invention is a new departure in sprinklers, being designed for the purpose of wetting the ground in square plots, thereby enabling the user to wet the corners of his lawn without wasting water on the walks or throwing it across the sidewalk or driveway as is necessarily done when a revolving sprinkler or one which throws the water in circles is used, if it wets the corners. It is necessary also in using the latter form to lap the circles well over one another in order to cover all the ground, thereby wetting much of it the second time. This difficulty is obviated by my invention, which wets at each setting a square space of ground. It can then be moved to a new position and allowed to wet another square which matches onto the first without necessarily lapping over it, in order to cover all the ground, thus saving both water and time. I attain this peculiar distribution of water by delivering it from a number of circular apertures in a head which is affixed to a vertical standard, these apertures being arranged in a certain definite order in relation to one another and in relation to the standard, which arrangement has been established after a great number of experiments, any slight deviation from which mars very materially the action of the instrument.

In the accompanying drawings, Figure 1 is a perspective view of the sprinkler mounted on a tripod. A is the head; B is the standard; C is a four way T; D. D. D. the three feet; H the hose.

Fig. 2 is a side view of head and standard showing half section and construction of head and strainer.

In Fig. 1 the tripod is shown having the hose attached to the outer extremity of one of the feet, this foot being formed of ordinary iron pipe of the proper size, thus making a conductor for the water.

Heretofore the hose has been attached directly to the standard or to the central casting, which made it difficult or impossible to draw the instrument over the lawn by means of the hose without upsetting it, thereby making it necessary to tramp on the wet ground in order to replace or reset it. My device obviates this difficulty, as the instrument can be drawn to any desired position without shutting off the water, simply by drawing on the hose.

The head A, Fig. 2, can be made in one solid piece, but is preferably made in two pieces. The top part *b*, technically called a shell, is made from sheet metal by dieing and pressing, and the lower part or base *d* is cast, having four projections or horns, b', b', b', b', which serve as a grip by which to screw the head in place, and also as pointers by which to set the sprinkler *l*, so that it will throw the water just where it is wanted.

The shell *b* is perforated with sixteen holes, arranged in eight pairs; four pairs to throw water diagonally from the center toward the corners of a square plot, and the other four pairs to throw it transversely from the center toward the sides of a square. These holes are so made that jets of water issuing from any pair will meet in a focus at a distance from the face of the orifices equal to the sum of the diameters of the two holes plus ten per cent. of same, and the angle at which they meet must be for each two holes throwing water for the corners thirty-seven and one-half degrees, while the upper jet must issue at an angle of ten degrees upward from the horizon when the standard B is in a vertical position, each pair of holes being in its own vertical plane and equidistant from the adjacent pairs and concentric to the head. The corner pairs *a. a.* are in the same vertical plane as their respective horns $b'\,b'$. The pairs $a'\,a'$, &c., which throw water to form the sides of the square are so made as to bring the jets together at an angle of sixty-five degrees the upper jet issuing at an inclination upward from the horizon to twenty-two and one-half degrees.

The effect of bringing the jets of water to-

gether as above described is to break them up into spray—the higher the velocity the finer the spray. Those meeting at an acute angle being less broken up have greater carrying capacity. This, together with the flatter discharge of the corner jets when combined, serves to carry the water well outward, while the more obtuse angle at which the side jets meet serves to break the water up finer, thus destroying its carrying power somewhat, which, together with its more nearly vertical delivery tends to bring the water to the ground nearer the center, the combination of the whole dropping the water over a well defined square with slightly rounded corners. The shell *b* is secured on the base by riveting over and inward an upward projecting lip shown in Fig. 2 at *b''*. The form of the shell should harmonize with the direction of the apertures—*i. e.*, the outer curve is described by striking a segment of a circle from the focal point at which any pair of jets meet, as shown in Fig. 2 at *x*. The base *d* is bored and threaded to screw it on the standard B.

The strainer *c* is made long and tapering and slightly flanged at top. It is removed for cleaning by screwing off the head.

Great trouble is experienced in keeping sprinklers with small holes clean. They clog up with weeds and algæ. This strainer catches all floating matter before it reaches the orifices, thus removing any liability to clog.

In Fig. 2 *d'* is a lock nut between which and the head is a rubber washer *e*, which facilitates the ready adjustment of the head. This method of producing a spray is equally applicable to smaller apparatuses, such as rose sprayers and tree sprayers, in which case only two orifices would be necessary.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A spray apparatus in which the exit or delivery holes are constructed and arranged radially in two series of alternating vertical pairs as set forth, in one series of which the axes converge at an acute angle, in the other or alternating series the axes converge at a less acute angle, the axes of each pair focusing separately in the same horizontal plane, the foci being equidistant from the vertical center line of apparatus, substantially as and for the purpose specified.

2. A lawn spray apparatus having a motionless but removable head with exit or delivery holes constructed and arranged in radiating vertical pairs as set forth, and provided with four horizontally projecting horns arranged vertically below four corresponding pairs of holes substantially as and for the purpose described.

3. A lawn spray apparatus consisting of a spraying device mounted upon a tubular water conducting standard provided with a plurality of feet, each of such feet being bent or constructed to form a comparatively smooth bearing surface and one of them serving as a conductor pipe from hose to standard, whereby the apparatus may be moved from place to place by drawing upon the hose.

4. A lawn spray apparatus resting upon a tripod one foot of which is used as a conductor pipe from hose to standard, this foot being furnished at its outer extremity where it rests upon the ground with means for attaching a hose, the inner extremity being slightly elevated and secured into a hollow base communicating with the tubular standard, the two remaining legs being secured into the opposite side of base and radiating outward and slightly downward, substantially as and for the purpose specified.

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