

Feb. 13, 1940.

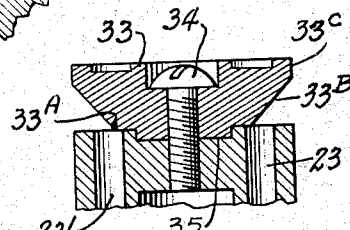
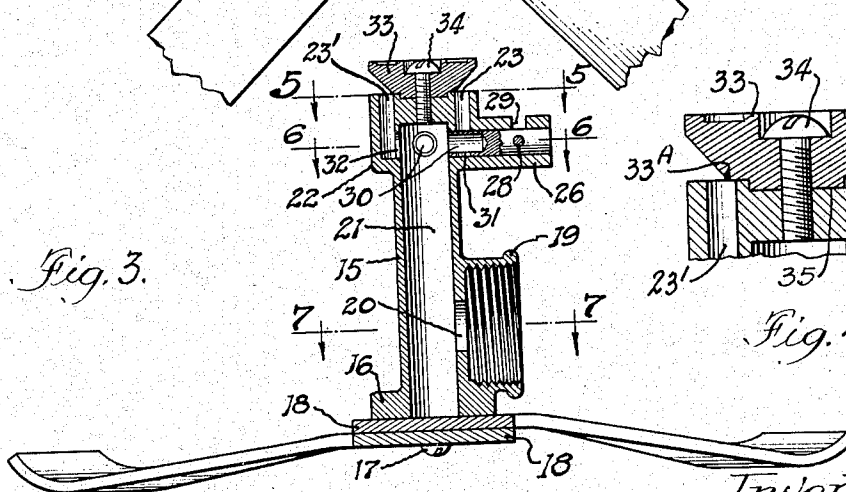
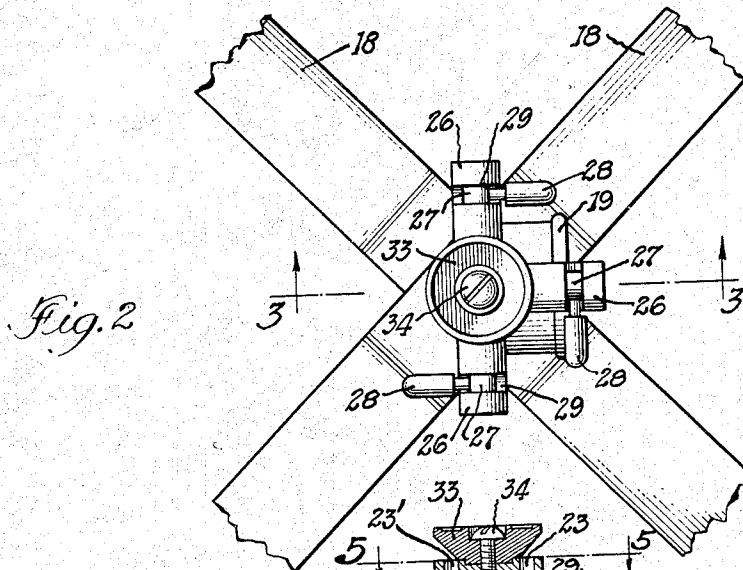
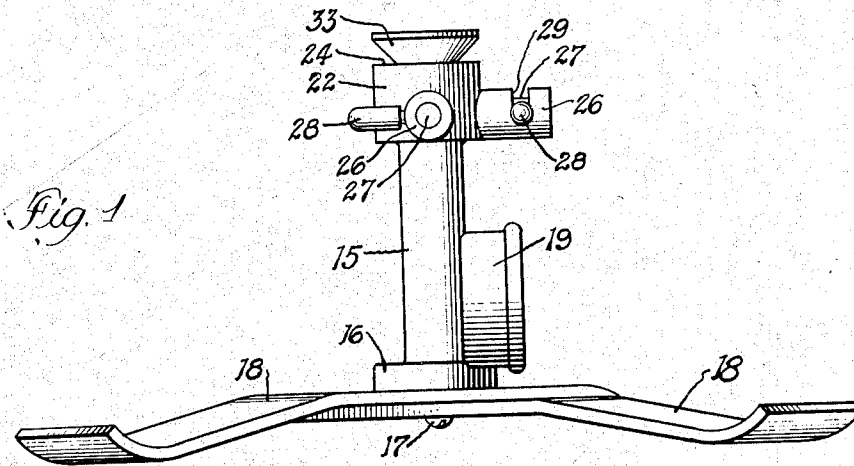
J. WITTEK

2,190,639

SPRAYING DEVICE

Filed Feb. 23, 1939

4 Sheets-Sheet 1



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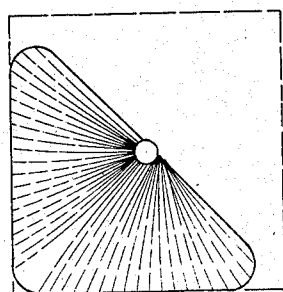
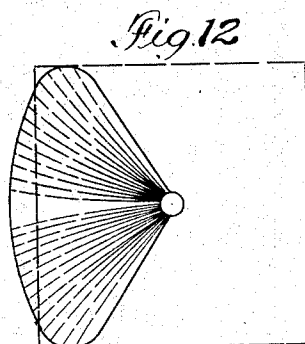
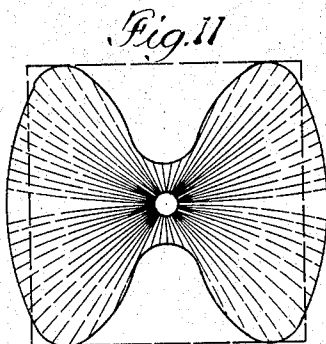
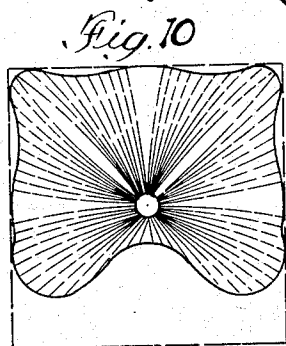
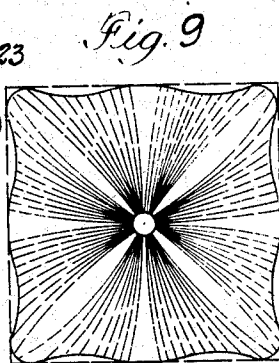
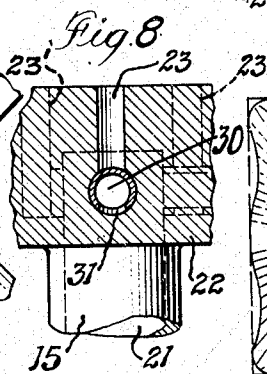
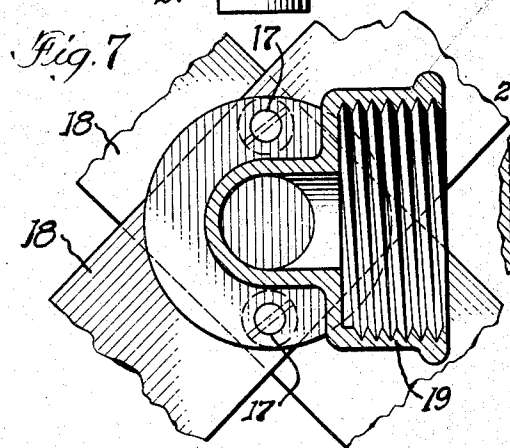
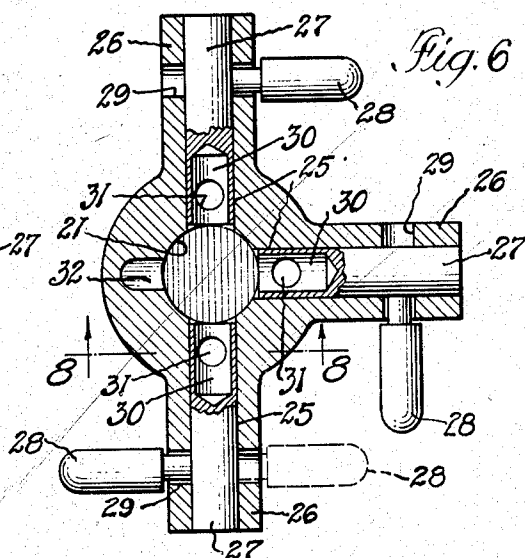
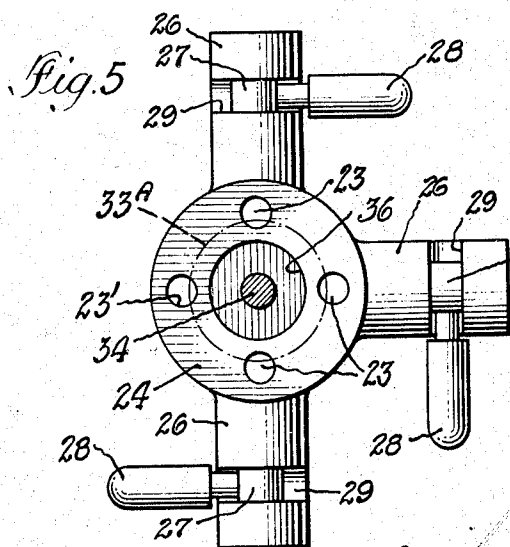
J. WITTEK

2,190,639

SPRAYING DEVICE

Filed Feb. 23, 1939

4 Sheets-Sheet 2



Inventor:
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Feb. 13, 1940.

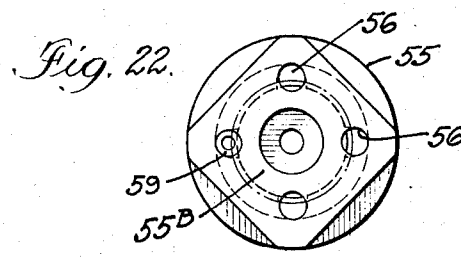
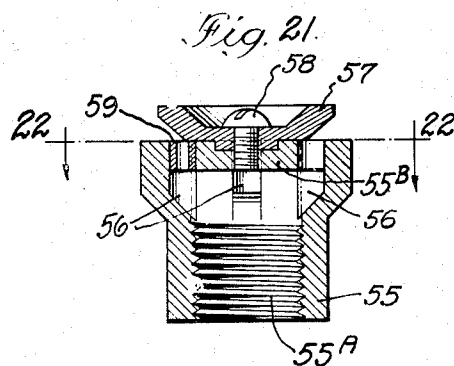
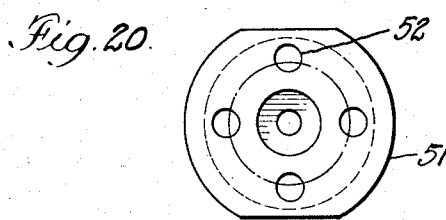
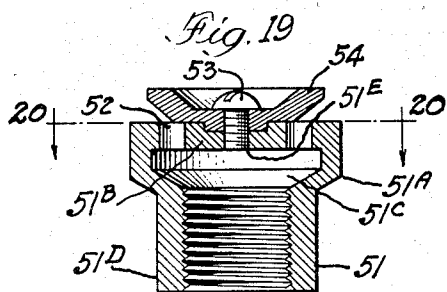
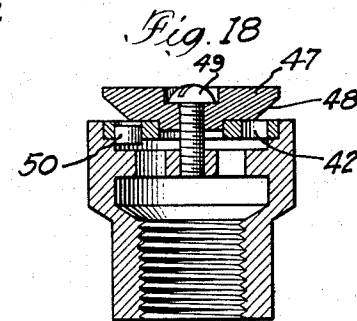
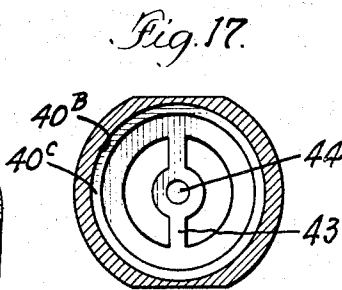
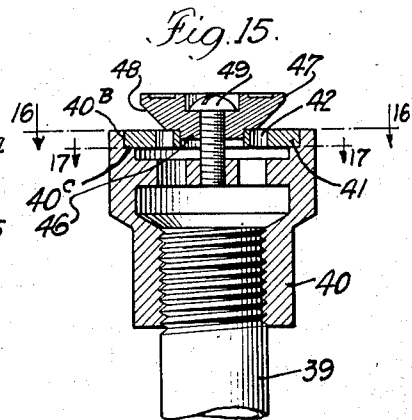
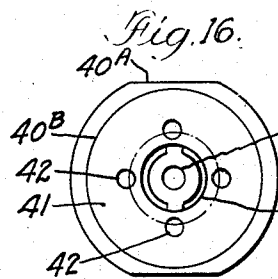
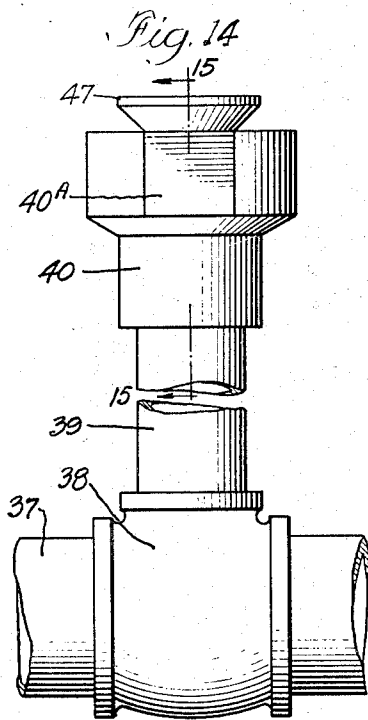
J. WITTEK

2,190,639

SPRAYING DEVICE

Filed Feb. 23, 1939

4 Sheets-Sheet 3



Inventor:
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Feb. 13, 1940.

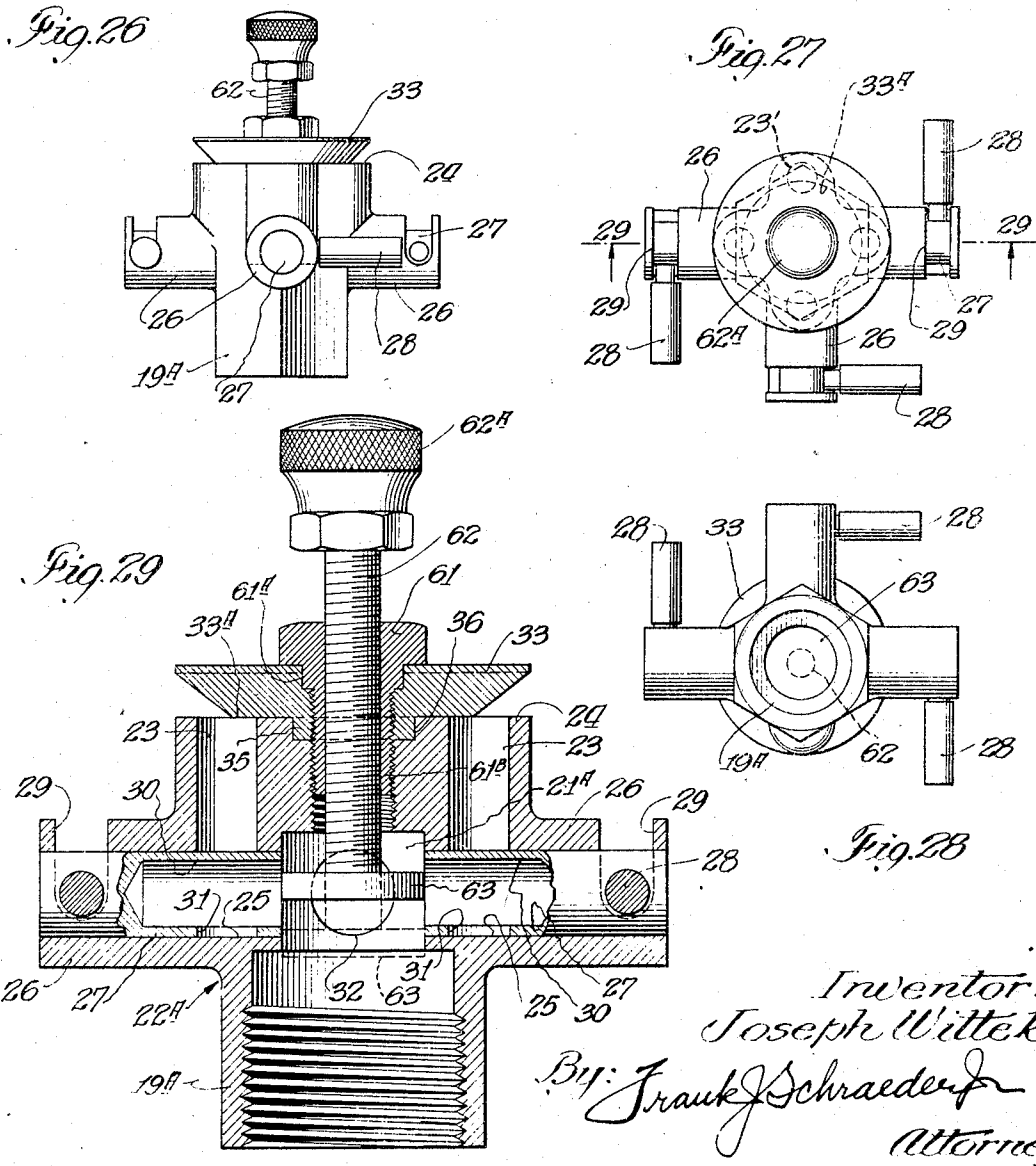
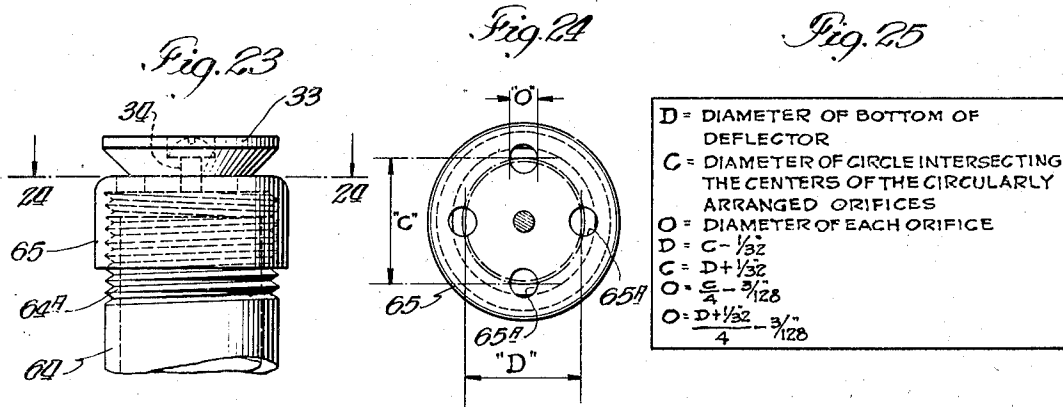
J. WITTEK

2,190,639

SPRAYING DEVICE

Filed Feb. 23, 1939

4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,190,639

SPRAYING DEVICE

Joseph Wittek, Pasadena, Calif.

Application February 23, 1939, Serial No. 258,006

16 Claims. (Cl. 299—18)

This invention relates to spraying devices adapted to spraying lawns, trees, and the like.

One of the objects of my invention is to provide a variably adjustable multi-jet water spraying device which is adapted to economical, systematic directionally-controlled spraying of defined areas with uniform saturation and without undue overlapping to a saving in time and water.

The device is preferably provided with a main valve and four outlets, three of which are preferably provided with individually controlled valves so that the spray patterns may be varied and also afford consecutive spraying of adjacent areas in defined selected spray patterns.

When all the four outlets are open the device will spray a substantially square area and, through the manipulation of the individual valves to coact in different combinations, the spray jets may be selectively directed in one or several differently combined directions to produce varied patterns of the sprayed areas.

The invention also has for its object to provide a novel sprinkler head including novel means for deflecting, evenly distributing and forcibly emitting finely divided mist-like sprays, thus affording a uniform coverage and gradual uniform saturation of a square.

Another object of my invention resides in the mounting and arrangement of the deflector relatively to the orifices of jet openings to thereby produce the finely divided mist-like spray and uniform saturation of the sprayed area.

Another object of my invention is found in the provision of a novel valve for each of the outlet openings which is simple in construction and low in cost of manufacture.

Still another object of my invention resides in the novel construction of the base which is designed to slide easily over a lawn without upsetting itself or damaging the lawn when the device is pulled by a hose in movement to selected locations.

A further object of my invention is to provide a novel spray head with a circular deflector positioned above a circular disk mounted on the outlet end of body of the spray head and provided with a plurality of discharge openings, said circular disk being adjustable relatively to the spray head body to thereby afford a selective directional adjustment of the several sprays emanating from the discharge openings therein.

A further object of the invention resides in the provision of a standard spray head with interchangeable discharge opening disks having discharge openings varying in sizes and number

thereof and adapted to cooperate with interchangeable deflectors of different diameters and walls of differing angular slope, including removable plugs in several of the discharge openings to afford selective spraying through one or more of the discharge openings in such disks.

A still further object of my invention resides in the provision of a spray head of simple construction comprising a tubular body having a perforated closure wall at one end and a deflector secured to said wall cooperating with the perforations in said wall to produce the desired spray.

With the above and other objects in view, my invention consists in the novel combination, construction and arrangement of the parts and members shown in preferred form in the drawings.

This application is a continuation in part of my abandoned application Serial No. 118,399, filed December 30, 1936.

In the drawings in which like reference characters indicate like or similar parts:

Fig. 1 is a side elevation of a spraying device embodying my invention,

Fig. 2 is a plan view of the device showing the base in part,

Fig. 3 is a vertical section taken on line 3—3 of Fig. 2,

Fig. 4 is an enlarged detail of a portion of the sprinkler head,

Fig. 5 is an enlarged cross-section taken on line 5—5 of Fig. 3 showing the outlets,

Fig. 6 is an enlarged cross-section taken on line 6—6 of Fig. 3 showing the valves,

Fig. 7 is an enlarged cross-section taken on line 7—7 of Fig. 3,

Fig. 8 is a cross-section taken on line 8—8 of Fig. 6 through one of the valves,

Fig. 9 is a diagrammatical illustration of the pattern of the sprayed area when all four jets are open,

Fig. 10 illustrates the pattern of the sprayed area when three jets are open,

Fig. 11 illustrates the pattern of the sprayed area when two opposite jets are open,

Fig. 12 illustrates the pattern of the sprayed area when only one open jet is used,

Fig. 13 illustrates the pattern of the sprayed area when two adjacent jets are used,

Fig. 14 is a side elevation of a spraying device embodying my invention and showing an adaptation of my invention to an upright water supply pipe for spraying trees, shrubbery and the like,

Fig. 15 is a vertical section taken on line 15—15 of Fig. 14,

Fig. 16 is a plan view of the device taken on line 16—16 of Fig. 14,

Fig. 17 is a cross-section taken on line 17—17 of Fig. 14,

Fig. 18 is a vertical section through the sprinkler head showing a larger deflector and modified adjustable outlet disk,

Fig. 19 is a vertical section through a modified spray head of simple construction wherein the outlet openings are fixed relatively to the body of the head,

Fig. 20 is a plan view taken on line 20—20 of Fig. 19,

Fig. 21 is a vertical section of a spray head similar to that shown in Fig. 19 but having comparatively large discharge openings cooperating with a larger type of deflector,

Fig. 22 is a plan view taken on line 22—22 of Fig. 21,

Fig. 23 is a modification showing simplified form of my invention,

Fig. 24 is a plan section taken on line 24—24 of Fig. 23 showing relative dimensions of orifices and deflector base,

Fig. 25 shows a table of formulae which I employ in my novel spray head design,

Figs. 26, 27 and 28 show, respectively, side elevation, plan view and bottom view of a spray head similar to that shown in Figs. 1 to 8 inclusive but provided with an additional main valve for controlling the amount of fluid passing from the source of supply to the four discharge openings, three of which are preferably controlled by individual valves, and

Fig. 29 is an enlarged vertical section taken on line 29—29 of Fig. 27.

The device as shown in Figs. 1 to 7 inclusive consists of a tubular body 15 having an enlarged flange 16 at its lower end to which I attach by means of screws 17 a pair of flat bars 18 in crossed over-lapping arrangement to constitute the supporting base therefor.

To provide a readily slidable base, the bars 18 are slightly deflected downwardly from their crossed central overlapping portions to thus retain the spray device slightly above the top of the lawn or ground, and at their ends, the bars are curved upwardly to thus provide curved supporting faces.

Near the lower end, the tubular body 15 is formed with an enlarged interiorly threaded connection 19 adapted to receive a standard threaded hose or pipe connection for admitting water through the side opening 20 into the vertical passage 21 of the body 15.

The upper end of the body 15 is enlarged to constitute the sprinkler head 22 which head is flattened at its upper end and provided with a plurality of vertically disposed spaced cylindrical passages 23 constituting the spray jets or outlet openings. I prefer to use four of such jets.

Three of these passages 23 extend from the top flat face 24 downwardly for communication with the laterally disposed passages 25 within the radially arranged valve housings or extensions 26 formed integrally with the head 22, and each of such passages 25 is provided with a cylindrical pin valve 27 for controlling the open or closed position of its respective spray jet 23.

Each pin valve 27 consists of a solid cylindrical bar adapted to fit closely within the passage 25, and the outer end of each pin is provided with an operating handle 28 disposed transversely to the longitudinal axis of the pin. Each extension

26 is provided with a semicircular cross-slot 29 within which the operating handle 28 can be oscillated between open and closed positions of the valve.

The inner end of each pin valve 27 extends to the passage 21 and is provided at such end with a longitudinal chamber or bore 30 which extends slightly beyond the vertical discharge jet opening 23 and each chamber 30 is also provided with a transverse opening 31 in the chamber wall which is adapted to register with the discharge opening 23.

Since the device would no doubt be used with no less than one spray jet I have preferred to omit the valve 27 for the discharge opening indicated by numeral 23' and have therefore provided an opening 32 in the lower end of the head 22 which provides direct open communication between such openings 23' and the passage 21.

The sprinkler head 22 is provided with a preferably removable novel deflector 33 which consists of a substantially solid inverted frusto-conical body secured to the top of the surface 24 by screw 34 and positioned relatively centrally to the head 22 and to the discharge end of the four discharge jets, openings 23 and 23'.

The lower face of the deflector 33 is preferably formed with a small circular extension 35 which is adapted to be seated in a similarly formed recess 36 in the upper face 24 of the head 22 to thereby insure a proper or precise positioning of the deflector, and particularly its lower marginal edge 33^A relatively to the orifices of the jet openings 23 and 23'.

In order to secure the desired directional, evenly and uniformly distributed and finely divided spray from the combined operation of all four of the jets 23 and 23', the diameter of the lower lateral face of the deflector 33 is so designed that its marginal rim 33^A overlaps portions of the orifices or outlet ends of the discharge jets 23 and 23' and the uncovered portions of the outlet ends of the discharge jets 23 and 23' are so positioned that streams of water emerging therefrom under pressure engage the conical face 33^B to thereby produce the desired square spray. See Fig. 5 of drawings for preferred relative proportions to secure uniform saturation.

As above pointed out, it is important that the deflectors be properly and precisely positioned and therefore its marginal edge 33^A must be for practical square-spraying and uniform saturation purposes, definitely located relatively to a circle intersecting the centers of the equally spaced orifices of the four jets, and the diameter of each of the four orifices must have a definite proportional relation to the diameter of such circle intersecting the centers of the four orifices in order to produce the desired uniform distribution and saturation of the sprayed square area.

It appears that such relative proportions and dimensions of the diameters of the equally spaced orifices, the diameter of the circle intersecting their centers and the diameter of the base portion of the conical deflector is controlled by physical or hydraulic laws at present unknown to me, however, I have discovered that a spray head such as herein disclosed which will produce a uniformly distributed spray adapted to provide a substantially uniform saturation of a square area is one which is based upon substantially a design in which:

The diameter of the base of the inverted frusto-conical deflector is substantially equal to the 75

diameter of a circle intersecting the centers of the equally spaced orifices less $\frac{1}{2}$ of an inch when the diameter of each of such four orifices is substantially $\frac{13}{32}$ of an inch, or in other words, if the diameter of the base of the deflector is $\frac{7}{8}$ of an inch, the diameter of a circle intersecting the centers of the four equally spaced orifices is $\frac{29}{32}$ of an inch and the diameter of each orifice is $\frac{13}{32}$ of an inch.

I have found that the above proportions produced the desired result, namely, a substantially uniform saturation of a square-sprayed area.

I have found that if the orifices are relatively proportionately larger, that the portions of the spray directed to the corners of such square-sprayed area will be comparatively concentrated with less water reaching the sides and intermediate parts of the sprayed square area.

If the orifices are relatively proportionately smaller than above set forth, then the portions of the square-sprayed area between the corners receive relatively proportionate more saturation than the corner portions.

If the diameter of the base of the deflector is relatively less than $\frac{7}{8}$ of an inch, the corners will receive proportionately or relatively more saturation than the other portions of the sprayed square area.

If the diameter of the base of the deflector is relatively greater than $\frac{7}{8}$ of an inch, then the corners will receive very little of the spray and the sprayed pattern will resemble that of four fan-shaped areas.

If the diameter of the circle intersecting the centers of the four orifices is relatively decreased, the discharge spray will be relatively concentrated in the direction of the four corners, and if such diameter is relatively increased, then less than the proper proportionate amount of water will be discharged in the direction of the corners and the intermediate parts of the sprayed square area will receive a proportionately greater saturation.

Variation of the pressure of the water passing through the spray head effects, within practical limits, the size of the sprayed square area as well as the fineness of the particles of such spray, since the higher the pressure, the finer the spray will be and the larger will be the sprayed square area. A comparatively great reduction in water pressure results in a coarser spray and smaller sprayed area.

The small upper marginal rim 33^c is preferably formed perpendicularly to the top lateral face of the deflector.

The valves 27 as shown in Figs. 1, 3, 4, 5, 6 and 8 are in closed position. The handle shown by broken line in the lower part of Fig. 6 indicates an open position of one of the valves.

Water admitted through a suitable hose or pipe connected to the connection 19 will pass through opening 20 into the passage 21 for discharge through the vertical outlets 23 and 23'. The outlet 23' is open to freely admit the flow of water through opening 32, but the other three outlets 23 are controlled by the pin valves 27.

A rotation of 180° of the valves 27 by means of the handles 28 will position the openings 31 of the valve end chambers 30 to register with their respective outlets 23 to permit the flow of the water from the main passage 21 through the open inner end of chambers 30 and through openings 31 into the discharge outlets 23.

When all of the valves 27 are opened the sprayed area is substantially represented by a

square pattern as shown diagrammatically by Fig. 9.

When three of the jets are open, the sprayed area is somewhat oblong as shown in Fig. 10.

The fan-shaped spray indicated in Fig. 12 afforded by the one valveless outlet 23' is used as a concentrated spray adapted particularly for spraying defined areas such as narrow parkways or flower beds.

When two adjacent jets are open, the resultant triangular spray indicated by Fig. 13 is particularly adaptable to spraying corners or triangular areas.

Figs. 14, 15, 16 and 17 illustrated the adaption of my invention to a device for spraying trees wherein 37 indicates a water supply pipe connected by the T 38 with an upright pipe 39 having a spray head 40 connected to the upper end thereof.

The spray head 40 is provided with a lower end which is interiorly threaded to receive the upper end of pipe 39 and the enlarged upper end is preferably formed with a pair of diametrically oppositely disposed flattened sides 40^a for wrench engagement.

The upper end of the head 40 is formed with a circular recess 40^b defined by an inwardly disposed circular seat 40^c adapted to receive a close fitting circular disk 41 having preferably a plurality of circularly spaced discharge openings 42. It is obvious that the diameter and the number of such openings 42 may be varied to suit the character of spraying desired.

The spray head 40 is also provided with a bridge 43 formed integrally with the body within or near the discharge end thereof and preferably disposed a spaced distance below the discharge opening disk 41.

The discharge disk 41 is preferably provided with a centrally disposed opening 45 adapted to receive the circular extension 46 formed integrally with the bottom of the deflector 47 to thereby afford proper setting of the deflector beveled wall 48 relatively to the circularly arranged openings 42.

The deflector 47 is provided with a central opening adapted to receive a screw 49 which extends into threaded engagement within the opening 44 of the bridge 43 and which upon tightening will securely retain both deflector 47 and disk 41 at the discharge end of the head 40.

In Fig. 18 I show a larger diameter deflector 47 cooperating with openings 42 spaced in a circle of a diameter greater than that shown in Fig. 15 wherein a smaller diameter deflector is shown. It will be noted that the angles of the deflector walls 48 are different and thereby vary the sprays emitted. Also, in Fig. 18 I show one of the several tightly fitted removable plugs 50 which may be furnished with each disk 41. One or more or all of these plugs 50 may be removed by the user to thereby afford discharge from a varying or selective number of discharge openings 42.

As above stated, an object or important feature of my invention resides in the adjustability of the discharge opening disk 41 relatively to the head 40.

It will be understood that the head 40 may be readily screw-mounted to the upper end of the vertical spray pipe 39 and that after such screw-mounting of the head 40, the screw 49 may be loosened or withdrawn to permit the turning of the disk 41 into a selected position relatively to trees or shrubbery disposed about such spray

pipe 39 to thereby adjust the positions of the discharge openings 42 for the desired directional spraying of such trees or shrubbery. When the proper directional adjustment is made, the tightening of screw 49 will retain such disk 41 in fixed position relatively to the head 40 and the things or area to be sprayed.

In Figs. 19 and 20, the spray head consists of a tubular body 51 having an enlarged outlet portion 51^A and an end closure wall 51^B with circularly spaced openings 52 communicating with a chamber 51^C of larger diameter than the inside diameter of the threaded pipe connection end 51^D. The closure wall 51^B is also provided with a central threaded opening 51^E adapted to receive the securing screw 53 which retains the deflector 54 securely in position on the outer face of wall 51^B.

In the modification shown in Figs. 21 and 22, the body 55 is provided with a passage 55^A of uniform diameter and the end closure wall 55^B is provided with circularly spaced discharge openings 56 arranged near the margin of the head and extending through the wall 55^B and the body wall therebelow for communication with the passage 55^A. The deflector 57 is secured to the wall 55^B by screw 58.

Figs. 21 and 22 also show another new and useful feature of my invention in the provision of removable sleeves 59 which afford variation in the character of the spray and amount of fluid discharged.

One or more or all of the openings 56 could be provided with these sleeves 59 of restricted openings and several sets of such sleeves with varying sizes of passages could be furnished with each of the heads shown in Figs. 19 and 20. I have shown only one of such interchangeable sleeves 59 in Figs. 21 and 22.

These sleeves 59 are of tubular form and are tight fitting in the openings 56 and positively retained against outward movement by the overlapping portion of the deflector 57.

Referring to the simplified spray head shown in Figs. 23 and 24 which embodies the principal features of my design and which is readily adaptable to low cost manufacture, 64 indicates a source of fluid supply as for example a pipe having a threaded outlet end 64^A on which is adapted to be screw-mounted my improved spray head consisting of a standard pipe cap 65 preferably provided with the four discharge openings or orifices 65^A drilled within the end of the cap 65. The deflector 33 is secured to the end of the cap 65 by a screw 34 preferably having its head disposed in the countersunk recess, as shown in Fig. 23.

Referring to the modification shown in Figs. 26 to 29 inclusive, the spray head 22^A includes a bottom interiorly threaded inlet pipe connection 19^A. The upper end portion is provided with preferably four vertically disposed circularly arranged discharge passages 23. Three of these passages extend from the top flat face 24 downwardly for communication with the laterally disposed passages 25 in the extensions 26. Each of these three passages 25 is provided with a cylindrical pin valve 27 for controlling the open or closed position of its respective discharge passage 23.

Each pin valve 27 consists of a solid cylindrical bar adapted to fit closely within the passage 25, and the outer end of each pin is provided with an operating handle 28 disposed transversely to the longitudinal axis of the pin. Each extension

26 is provided with a semi-circular cross-slot 29 within which the operating handle 28 can be oscillated between open and closed positions of the valve.

The inner end of each pin valve 27 communicates with the interior cylindrical chamber 21^A and is provided at such end with a longitudinal chamber or bore 30 which extends slightly beyond the vertical discharge jet opening 23 and each chamber 30 is also provided with a transverse opening 31 in the chamber wall which is adapted to register with the discharge opening 23.

Since the device would no doubt be used with no less than one spray jet I have preferred to omit the valve 27 for the discharge opening indicated by numeral 23' and have therefore provided an opening 32 in the lower end of the head 22 which provides direct open communication between such openings 23' and the passage 21^A.

The sprinkler head 22 is provided with a preferably removable novel deflector 33 which consists of a substantially solid inverted frusto-conical body secured to the top of the surface 24 by screw 61 and positioned relatively centrally to the head 22^A and to the discharge end of the four discharge jets, openings 23 and 23'.

The lower face of the deflector 33 is preferably formed with a small circular extension 35 which is adapted to be seated in a similarly formed recess 36 in the upper face 24 of the head 22^A to thereby insure a proper or precise positioning of the deflector, and particularly its lower marginal edge 33^A relatively to the orifices of the jet openings 23 and 23'.

In order to secure the desired directional, evenly and uniformly distributed and finely divided spray from the combined operation of all four of the jets 23 and 23', the diameter of the lower lateral face of the deflector 33 is so designed that its marginal rim 33^A overlaps portions of the orifices or outlet ends of the discharge jets 23 and 23' and the uncovered portions of the outlet ends of the discharge jets 23 and 23' are so positioned that streams of water emerging therefrom under pressure engage the conical face 33^B to thereby produce the desired square spray. See Fig. 5 of drawings for preferred relative proportions to secure uniform saturation.

The upper face of the deflector 33 is centrally recessed for the cylindrical collar portion 61^A of the retaining screw 61 which is threaded into the central portion of the head 22^A. The screw 61 is provided with an interiorly threaded passage 61^B adapted to receive the threaded stem 62 the lower end of which is connected to a main circular disk valve 63 shown in partially open position in Fig. 29 and which valve 63 is adapted to be moved up and down in the cylindrical chamber 21^A to control the amount of the flow of the fluid into the discharge outlets 23 and 23'.

The valve stem 62 is preferably provided with a knurled head 62^A.

To insure uniform saturation through uniform distribution and discharge, all of the various spray heads shown on the attached drawings are designed on the basic relative proportions illustrated in Figs. 24 and 25, wherein D designates the diameter of the base of the inverted frusto-conical deflector, C the diameter of the circle intersecting the centers of the circularly arranged discharge orifices, and O the diameter of each discharge orifice.

While I have illustrated and described my invention as adapted to a water spraying device I

do not wish to be understood as limiting my invention to such particular use, since it is obvious that various uses and adaptations of my invention will become readily apparent in the perusal of the above specification and attached drawings and likewise various changes and modifications in the details of construction herein shown may be made without departing from the spirit of the invention embodied in the scope of the appended claims.

I claim:

1. In a spraying device, a spray head having a plurality of circularly arranged discharge passages and an inverted frusto-conical deflecting wall disposed in overlapping face contact with the orifices of said discharge passages, the diameter of the bottom face of said deflector wall being slightly less than the diameter of a circle intersecting the centers of said orifices.

2. In a spraying device, a spray head having a plurality of circularly arranged discharge openings spaced equi-distant of the center of the head, and an inverted frusto-conical deflector disposed relatively centrally to said openings, said deflector having a lower circular face the diameter of which is slightly less than the diameter of a circle intersecting the centers of said discharge openings and the marginal edge of said deflector face being in constant contact with the orifices of said openings, said deflector being removably supported on said head in relatively stationary position.

3. In a spraying device as embodied in claim 2 and including a cylindrical rotary valve for not less than one of said discharge openings.

4. A fluid spraying device comprising a tubular body having a longitudinal fluid passage therein, a supporting base for said body, an inlet for said body passage, a spray head at the upper end of said body, a plurality of valve-controlled discharge jets in said spray head adapted to communicate with said longitudinal passage, and a deflector having an inverted conical face adapted to be engaged by the streams of fluid discharged through one or more of said jets, said deflector comprising a removably mounted inverted frusto-conical body the marginal edge of the lower face of which is adapted to cover portions of the discharge ends of said jets, and said jets comprising vertical spaced tubular passages disposed circularly about said longitudinal passage, and each of said valves comprising a rotatable cylindrical member having a chamber communicating at one end with said longitudinal passage and an opening in the wall of said chamber adapted to be moved to and from registered positions with its respective tubular jet passage upon partial rotation of the valve member.

5. A fluid spraying device comprising a tubular body having a longitudinal fluid passage therein, a supporting base for said body, an inlet for said body passage, a spray head at the upper end of said body, a plurality of valve-controlled discharge jets in said spray head adapted to communicate with said longitudinal passage, and a deflector having an inverted conical face adapted to be engaged by the streams of fluid discharged through one or more of said jets, said deflector comprising a removably mounted inverted frusto-conical body the marginal edge of the lower face of which is adapted to cover portions of the discharge ends of said jets, and said jets comprising vertical spaced tubular passages disposed outwardly of said longitudinal passage, and each of said valves comprising a rotatable cylindrical

member having a chamber communicating at one end with said longitudinal passage and an opening in the wall of said chamber adapted to be moved to and from registered positions with its respective tubular jet passage upon partial rotation of the valve member, and said base comprising a pair of flat crossed over-lapping bars secured to the lower end of said tubular body, said bars being deflected downwardly from their overlapped central portions and having upturned ends to thereby provide curved supporting faces thereon.

6. The combination with a fluid supply pipe, of a spray head mounted on one end of said pipe, said spray head comprising a tubular body, an inverted frusto-conical deflector removably mounted on the discharge end of said body, a disk removably mounted at the discharge end of said body having a plurality of circularly spaced discharge openings having circular orifices adapted to discharge fluid into deflecting engagement with said deflector, the base of said deflector having a circular marginal edge disposed to cover less than one-half of the area of said orifices of said discharge openings, and means for securing said deflector and said disk to said body.

7. The combination as embodied in claim 6 and including a bridge formed integrally with and within the discharge end of said body, and said means comprising a screw extending through said deflector into tightening engagement with said bridge to thereby secure said deflector and said disk to said body.

8. A spray head comprising a body having a passage therein extending inwardly from the inlet end of said body, a wall formed integrally with said body at the discharge end of said passage, a plurality of discharge openings in said wall communicating with said passage, removable tubular sleeves mounted in said discharge openings to restrict the cross-sectional area of the discharge openings, and an interchangeable deflector removably mounted on the end of said body having deflecting means adapted to be engaged by the fluid jets discharged through said sleeves.

9. A spray head comprising a body having an inlet passage extending inwardly from one end of said body, a closure wall formed integrally with said body at the outlet end of said passage, said closure wall having a plurality of discharge openings spaced circularly and communicating with said passage, a deflector having a frusto-conical deflecting wall mounted on said closure wall, said deflecting wall being adapted to be engaged by the jets of fluid discharged from said discharge openings, the diameter of the base of said deflector being slightly less than the diameter of a circle intersecting the centers of said discharge openings, and means for securing said deflector to said closure wall.

10. In a spray head for a spray device adapted to discharge a substantially uniformly distributed spray for uniform saturation of a substantially square area comprising a body having a cylindrical inlet passage, four cylindrical discharge passages communicating with said inlet passage and having circularly arranged equally spaced circular orifices, an inverted frusto-conical deflector disposed centrally relatively to said orifices and having its small end in stationary face contact with and over-lapping portions of said orifices, the diameter of said small end of said deflector being slightly less than the diameter of

a circle intersecting the centers of said circular orifices.

11. In a spray head for a spray device adapted to discharge a substantially uniformly distributed spray for uniform saturation of a substantially square area comprising a body having a cylindrical inlet passage, four cylindrical discharge passages communicating with said inlet passage and having circularly arranged equally spaced circular orifices, an inverted frusto-conical deflector disposed centrally relatively to said orifices and having its small end in stationary face contact with and overlapping portions of said orifices, the diameter of said small end of said deflector being slightly less than the diameter of a circle intersecting the centers of said circular orifices, and the diameter of each circular orifice being slightly less than one-fourth of the diameter of the circle intersecting the centers of said circular orifices.

12. In a spray head for a spray device adapted to discharge a substantially uniformly distributed spray for uniform saturation of a substantially square area comprising a body having a cylindrical inlet passage, four cylindrical discharge passages communicating with said inlet passage and having circularly arranged equally spaced circular orifices, an inverted frusto-conical deflector disposed centrally relatively to said orifices and having its small end in stationary face contact with and overlapping portions of said orifices, the ratio of the diameter of said deflector small end to the diameter of a circle intersecting the centers of said circular orifices being substantially 28 to 29.

13. In a spray head for a spray device adapted to discharge a substantially uniformly distributed spray for uniform saturation of a substantially square area comprising a body having a cylindrical inlet passage, four cylindrical discharge passages communicating with said inlet passage and having circularly arranged equally spaced circular orifices, an inverted frusto-conical deflector disposed centrally relatively to said orifices

and having its small end in stationary face contact with and overlapping portions of said orifices, the ratio of the diameter of said deflector small end to the diameter of a circle intersecting the centers of said circular orifices being substantially 28 to 29 and the ratio of the diameter of any one of said orifices to the diameter of the circle intersecting the centers of said circular orifices being substantially 13 to 58.

14. A spray head comprising a body having an inlet end and a discharge end provided with a plurality of circularly arranged circular discharge orifices and an inverted frusto-conical deflector having its smaller end in face contact with said discharge end, and wherein the relative proportional dimensions of the diameter of the smaller end of said deflector, the diameter of each of said orifices, and the diameter of a circle intersecting the centers of said circularly arranged orifices are substantially defined by the following formulae:

D=diameter of smaller end of deflector,
C=diameter of circle intersecting the centers of the circularly arranged orifices,
O=diameter of each of said orifices—

$$D = C \text{ less } \frac{1}{32} \text{ of an inch,}$$

$$C = D \text{ plus } \frac{1}{32} \text{ of an inch,}$$

$$O = \frac{C}{4} \text{ less } \frac{3}{128} \text{ of an inch,}$$

$$O = \frac{D \text{ plus } \frac{1}{32} \text{ of an inch}}{4} \text{ less } \frac{3}{128} \text{ of an inch.}$$

15. A spray head as embodied in claim 9, and including a valve in said inlet passage for controlling the amount of fluid flowing through said inlet passage into and through said discharge openings.

16. A spray head as embodied in claim 9, and including one or more of said discharge openings provided with a valve, and a main valve in said inlet passage for controlling the amount of fluid flowing through said inlet passage into said discharge openings.

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