

April 28, 1959

L. B. SMITH  
LAWN SPRINKLER

2,884,202

Filed April 11, 1956

3 Sheets-Sheet 1

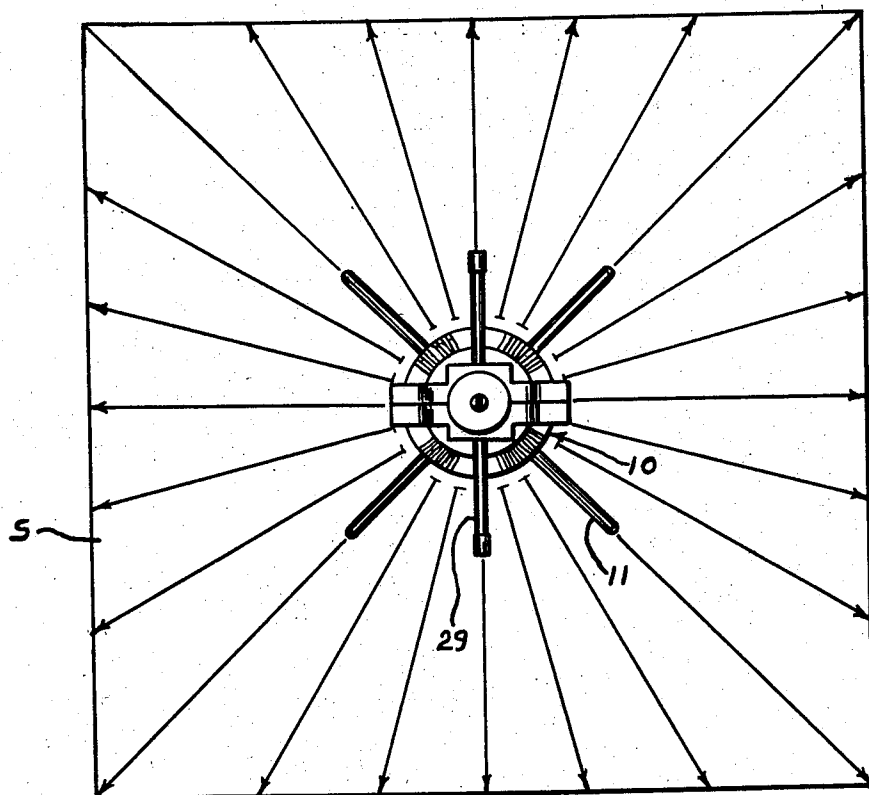


Fig. 1

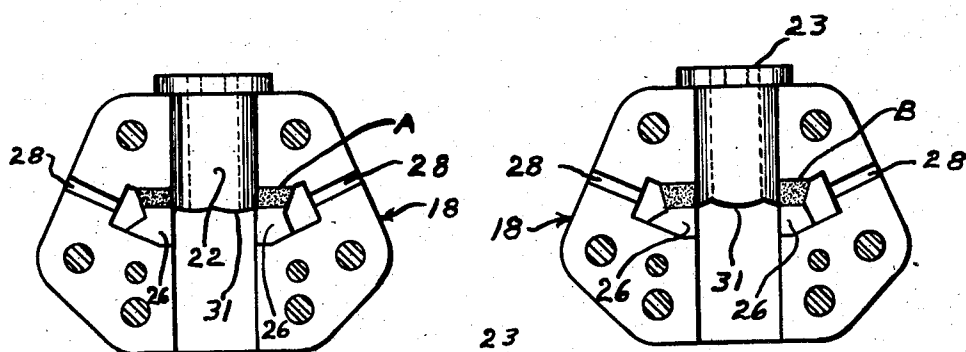


Fig. 4

Fig. 5

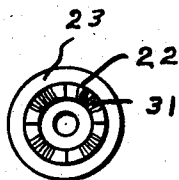


Fig. 6

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3 Sheets-Sheet 2

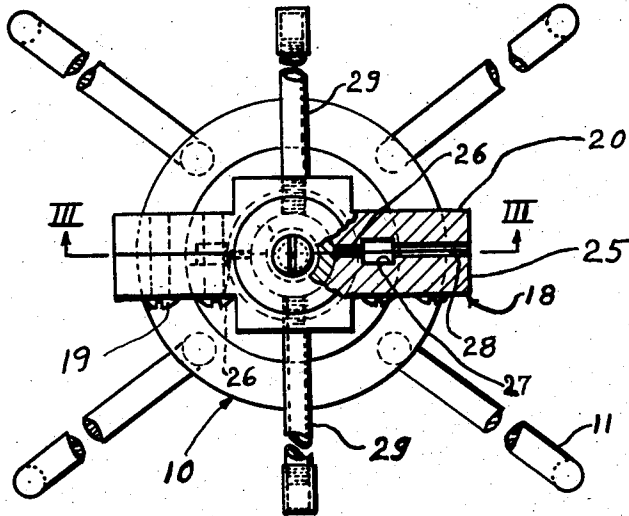


Fig. 2

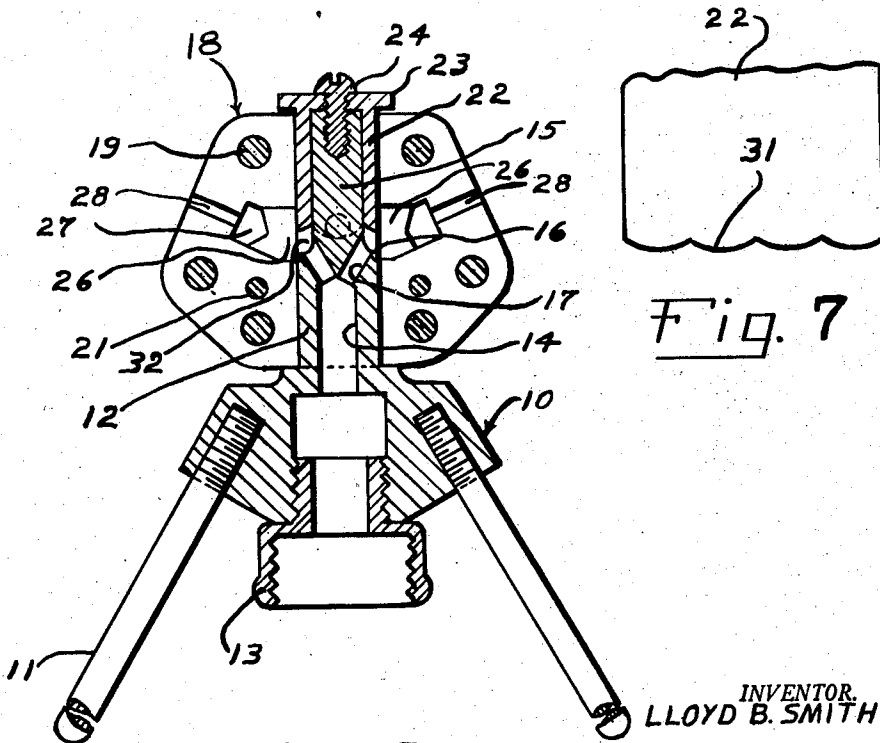


Fig. 7

Fig. 3

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3 Sheets-Sheet 3

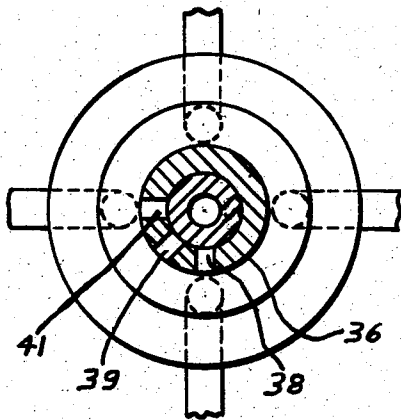


Fig. 10

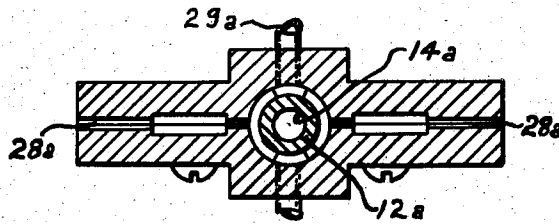


Fig. 9

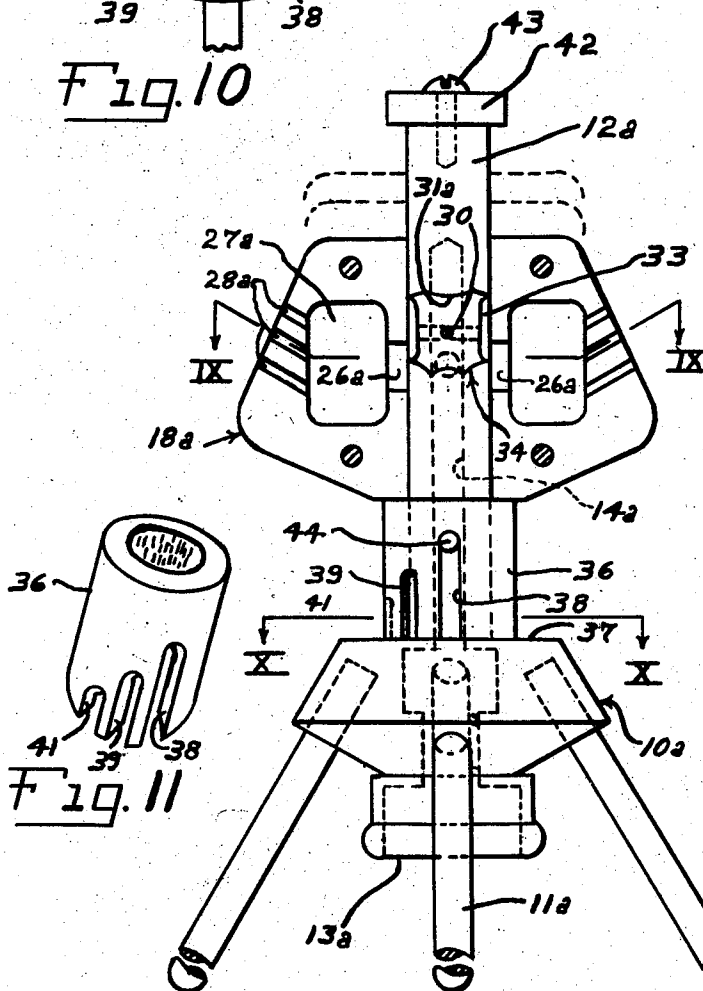


Fig. 8

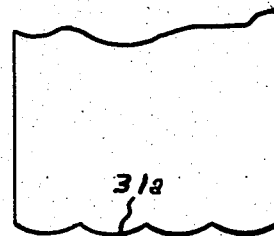


Fig. 12

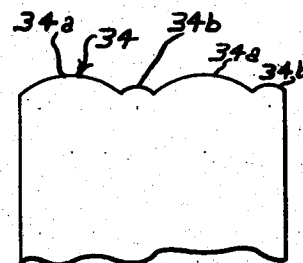


Fig. 13

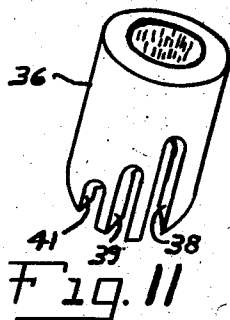


Fig. 11

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## LAWN SPRINKLER

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7 Claims. (Cl. 239—97)

My invention relates to sprinklers of the type used to sprinkle lawns and larger areas such as pastures, fields and the like.

My invention relates particularly to a sprinkler which shall be effective accurately to deliver an even spray or stream of water over an area or plot of ground which is square or rectangular in configuration or, selectively, to sprinkle in a circular pattern.

My invention contemplates a sprinkler of the character designated in which the means to bring about effective pattern distribution of water comprises a very simple mechanism, embodying no moving parts other than the usual rotary sprinkler head, the parts being so relatively disposed that they may be accurately machined, thereby making my invention readily adaptable to mass production.

Another object of my invention is to provide a sprinkler which consists essentially of a stationary body portion having an upstanding column thereon around which rotates the sprinkler head proper, the column being hollow to provide a passage for supplying water, there being an annular opening around the column in position to discharge water into the openings leading to the spray orifices of the head, and there being a surface on at least one edge of the annular opening which is of a configuration to admit varying quantities of water to the head as the head rotates, all to the end that when the water discharging jets of the head are pointed toward, for instance, the corner of a square plot, more water is delivered, and whereby the quantity of water decreases from that point as the head rotates, thus spraying a square or sharp cornered pattern.

A further object of my invention is to provide a sprinkler of the character designated in which the opposite surfaces at the ends of the annular water passage around the column are shaped differently, together with means to cause the water delivered to the sprinkler head to be varied in accordance with the pattern of said surfaces, selectively, or, so to position the head relative to said annular water space that neither of said surfaces is effective to vary the amount of water delivered to the head, whereby the sprinkler delivers water in the usual circular pattern.

A more detailed object is to provide a sprinkler of the character just described in which the head may be raised and held in different elevated positions relative to the column thereby to select the one of said surfaces at the end of said annular water space which is effective to deliver varying quantities of water, whereby the sprinkler may be designed to deliver water over either a square or rectangular pattern, or any other desired pattern, depending upon the configuration of said surfaces.

A more general object is to provide a sprinkler of the character described which shall be extremely simple of manufacture, trouble free in operation and which shall be accurate in that the water is delivered in a more precise pattern, square, round, or rectangular, as the case may be.

Briefly, my invention comprises a sprinkler which has

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a stationary base or body supported from the ground on legs. Water is delivered to the base, there being an opening which extends upwardly through an upstanding round column carried by the base. The water is discharged outwardly from the central part of the column into an annular water space surrounding the column. On at least one edge of the annular opening I machine or otherwise provide curved portions, the contour of which determines the pattern to be delivered, as will appear. Mounted to rotate about the column is a sprinkler head having relatively narrow slots for the admission of water from the annular space. The narrow slots rotate in fixed position to the contoured edge of the annular opening, whereby as the head rotates the slots rotate past the surfaces just mentioned, receiving varying quantities of water. By properly designing the contour or configuration of the surface of the annular opening as will be hereinafter more particularly explained I can cause the sprinkler to deliver water in a square or rectangular pattern, or in any other desired pattern. As a modification of my invention I mount the sprinkler head slidably on the column and provide means for holding the same in fixed axial position thereon. I therefore am enabled to contour the metal at both ends of the annular opening, one pattern for each edge. By raising the head so that the narrow slots therein cooperate in selective manner with the contoured edges of the annular space, I provide in one sprinkler a multiple and selectable spray pattern. In like manner, by positioning the slots in the sprinkler head intermediate the contoured edges of the annular space I can deliver from the sprinkler an ordinary circular pattern of water.

Apparatus illustrating features of my invention is shown in the accompanying drawing in which:

Fig. 1 is a wholly diagrammatic plan view of my improved sprinkler shown spraying a square pattern;

Fig. 2 is an enlarged detail plan view partly broken away and in section;

Fig. 3 is a detail sectional view taken generally along line III—III of Fig. 2;

Fig. 4 is a detail sectional view of one half of the sprinkler head and the pattern forming bushing, both removed from the remainder of the apparatus and with the sprinkler head in position to receive the greatest amount of water;

Fig. 5 is a view corresponding to Fig. 4 and showing the parts in position in which the sprinkler is receiving the least amount of water;

Fig. 6 is an end view of the bushing which has formed thereon the surfaces determining the pattern of delivery of water by the sprinkler;

Fig. 7 is a developed view of the surface on the end of the bushing shown in Fig. 6 and is wholly diagrammatic;

Fig. 8 is a side elevational view, partly in section, and showing a modified form of my invention in which the pattern delivered by the sprinkler may be selected;

Fig. 9 is a detail sectional view taken generally along line IX—IX of Fig. 8;

Fig. 10 is a detail sectional view taken generally along line X—X of Fig. 8;

Fig. 11 is a detached isometric view of the adjusting collar employed with the modified form of sprinkler;

Fig. 12 is a wholly diagrammatic developed view showing the configuration of the pattern determining surface at the upper edge of the annular water slot; and,

Fig. 13 is a view similar to Fig. 12 showing the configuration of the pattern determining surface at the bottom of the annular slot.

Referring now to the drawings and more particularly to Figs. 1 to 7 inclusive it will be seen that my invention

comprises a base portion 10 which may conveniently be supported from the ground by means of legs 11. As shown in the detailed drawings the base comprises an upstanding column portion 12. Water is admitted to the body through the usual hose coupling 13, the column being provided with a centrally disposed water passage 14.

The column 12 is provided with a reduced diameter upper portion 15, a shoulder 16 being thus formed. Water supply passages 17 lead upwardly and outwardly from the central openings 14 whereby water is supplied to the outer surface of the column, just above the shoulder 16.

The sprinkler head 18 comprises a pair of substantially identical halves 20 and 25 which are drilled out to fit over the column 12 with a rotating fit. The halves may be held assembled by a plurality of screws 19 and match pins 21. The assembled sprinkler head may be held rotatably in place by means of a sleeve 22 which has a shoulder 23 thereon, the column being drilled and tapped to receive a screw 24.

The matching halves of the head 18 are provided with relatively narrow water slots 26 which open into larger volume openings 27 which in turn open into the actual water delivery jets 28. It will thus be seen that water is free to flow from the connection 13 through the opening 14, openings 17, thence out to the jets 28 for delivery onto the ground. The sprinkler may be provided with one or more reaction jet tubes 29 from the ends of which water may be discharged, thereby to rotate the sprinkler head as is well known in the art.

My improved and simplified means for causing the sprinkler just described to deliver a square pattern of water as indicated in Fig. 1 consists in forming on the lower end of the bushing 22 a series of curved surfaces indicated at 31. As best shown in the developed view, Fig. 7, the surface on the end of the bushing which as will be seen defines with the shoulder 16 an annular water passage indicated by the number 32 coacts with the narrow slots 26 to admit varying quantities of water to the jets 28 as the head rotates. Thus, due to the lobe-like contour of the edge of the annular space 32, when the jets are directed toward the corners of the square S in Fig. 1, a larger quantity of water per degree of rotation of the head is discharged through the jets 28 than is the case when the jets move to a position at right angles to a side of the square. These two relationships are illustrated diagrammatically in Fig. 4 wherein it will be seen that the shaded area A in Fig. 4 indicates the amount of area blanked off from the jets 28 in the position of the head, this being the position in which maximum water is delivered to the jets 28. When the head has rotated to the position shown in Fig. 5 it will be seen that the shaded area B is blanked off due to the lobe-like configuration 31, whereby less water is delivered to the jets 28.

From the foregoing the method of manufacturing and using my improved sprinkler and advantages thereof may now be readily explained and understood. It will be understood that the parts are so fitted that the head 18 is readily rotatable on the column 12 and about the bushing 22, the bushing being held non-rotatable by the screw 24. With water under pressure admitted to the opening 14 it will be apparent that the reaction jets 29 cause the entire head 18 to rotate. Rotation presents the narrow slots 26 to the contoured surface 31 in such manner that whenever the contoured surface blanks off a larger part of the slots 26, less water is discharged. Conversely, when the contoured portion 31 blanks off a smaller area more water is delivered from the jets 28. By making the entire contour 31 of a four lobed configuration it will be apparent that the low places therein correspond to the corners of the square whereas the highest point of the lobes correspond to a position of the jets 28 at right angles to the sides of the square.

Referring now to Figs. 8 to 13 inclusive, I show a slightly modified form of my invention in which each

edge of the contoured annular water passage around the column is contoured differently and in which there is means to cause the narrow water passages in the head to cooperate selectively with either of said surfaces or, with neither of them.

As shown in the figures referred to, the base or body portion 10a has an upstanding centrally disposed round column 12a. The base may be supported on the legs 11a and water may be admitted through a fitting 13a, to pass upwardly through a centrally disposed opening 14a.

The column 12a is cut away to provide an annular water passage 33. Radially directed openings 30 admit water to the annular passage 33 from the opening 14a.

The upper surface indicated at 31a, that is, the upper edge of the annular passage 33, is contoured identically with the contour 31 whereby when the water passages in the sprinkler head coact therewith the sprinkler delivers a square pattern, as presently will appear. The lower or opposite edge of the annular passage 33 is contoured as indicated at 34, see Fig. 13. As best shown in Fig. 13 the contour 34 consists of the longer lobes 34a and the shorter, lower lobes 34b. It will also be noted that the surfaces 31a and 34 are spaced relatively a great distance apart for a purpose presently to appear.

The sprinkler head 18a is adapted to rotate about the column 12a as has already been explained. The narrow water passages 26a are adapted to coact selectively with the surfaces 31a or 34, depending upon the relative elevation of the sprinkler head on the column. The sprinkler may be provided with enlarged passages 27a, corresponding functionally to the passages 27 already explained and with jets 28a, likewise functionally identical with the jets already mentioned. The means for determining the elevation of the head consists simply of a sleeve 36 which rests on the surface 37 of the base 10a. The sleeve is provided with a longer slot 38, a slot of intermediate length indicated at 39, and a shorter slot indicated at 41. The column may be provided with a stop washer 42 held in place by means of a screw 43.

The operation of the modified form of my improved sprinkler is substantially identical with that already described. For instance, with the slot 38 in place over the pin 44 as indicated it will be apparent that the narrow water inlet slots 26a of the sprinkler head 18a are in position to cooperate with the annular passage 33. Water admitted to the jets 28a through the slots 26a is limited by the contour and configuration of the surface 34. By sliding the head upwardly sliding the sleeve 36 upwardly and placing slot 39 over pin 44, the inlet slots 26a will lie intermediate the surfaces 31a and 34, whereby the sprinkler delivers a circular pattern of water. In like manner by positioning slot 41 over pin 44 the slots 26a cooperate with the surface 31a, whereby the sprinkler delivers a square pattern. It will be understood that the surface 34 is so arranged that when the slots 26a are cooperating with the surfaces 34a water is being delivered to the longer, closer side of a rectangle. When cooperating with the surfaces 34b water is being delivered to a shorter length, farther away side of the rectangle.

From the foregoing it will be apparent that I have devised an improved sprinkler for delivering water in varying patterns. I have found that my improved sprinkler is especially adapted for delivering equal quantities of water even at different pressures and over different total distances. It will be apparent that my invention is characterized by its extreme simplicity. In the modified form shown in Figs. 8 to 13, inclusive, the change from a rectangular pattern to a round pattern to a square pattern requires only a moment to set the sleeve 36 to any one of the selected positions indicated.

In practice my invention has proved extremely satisfactory. Either form of my invention readily lends itself to mass production methods and hence I can produce the same in quantity at a low cost.

While I have shown my invention in but two forms, it

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will be obvious to those skilled in the art that it is not so limited but is susceptible of various other changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. A liquid sprinkling device comprising an upstanding column having a liquid passage therein adapted to be connected to a source of liquid supply, said column having a substantially horizontal, uninterrupted annular liquid passageway therein in continuous communication with said passage in the column and having a cam surface along at least one circumferential edge thereof, a sprinkler head portion mounted for rotation on said upstanding column and surrounding said uninterrupted passageway, said sprinkler head portion having a liquid discharge passage therein in continuous communication with said uninterrupted passageway, whereby upon introducing liquid to said upstanding column the liquid will be continuously discharged through said discharge passage and upon relative rotation of said head portion with respect to said upstanding column the amount of liquid discharged will vary according to the contour of said cam surface.

2. A sprinkler as defined in claim 1 in which there are cam surfaces along both edges of said uninterrupted annular passageway which are effective to admit different quantities of water to the discharge passage in the sprinkler head portion as said sprinkler head portion rotates relative to said upstanding column, and positioning means operatively interposed between said upstanding column and said head portion positioning said surfaces in selected positions relative to said discharge passage in the head portion, whereby the pattern of liquid discharged may be varied.

3. A liquid sprinkling device comprising a stationary base portion, a generally vertical column carried by said base portion and having a liquid passage therein adapted to be connected to a source of liquid supply, said column having a substantially horizontal, uninterrupted annular liquid passageway therein in continuous communication with said passage in said column and having a cam surface along at least one circumferential edge thereof, a sprinkler head portion mounted for rotation on said upstanding column and surrounding said uninterrupted annular passageway, said sprinkler head portion having a vertically elongated liquid discharge passage therein in continuous communication with said uninterrupted annular passageway, whereby upon introducing liquid to said upstanding column the liquid will be continuously discharged through said discharge passage and upon relative rotation of said head portion with respect to said upstanding column the amount of liquid discharged will vary according to the contour of said cam surface.

4. In a sprinkler, a stationary base portion having

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thereon a vertically disposed column, there being an annular water passage surrounding the column and having differently contoured upper and lower edges, means to supply water to the annular water passage, a head mounted for substantially fluid tight rotation on the column about the annular passage and disposed to receive water therefrom, means operatively to hold the sprinkler head in selected elevated position on the column whereby a selected edge of the annular passage admits varying amounts of water to the head as it rotates, thereby to deliver a selected spray pattern conforming to said selected edge.

5. A sprinkler as defined in claim 4 in which the means operatively to hold the sprinkler head in selected elevated position on the column comprises a sleeve-like member rotatably mounted on the column, there being a plurality of slots of different lengths in the sleeve, and a member on said column cooperable with the slots thereby to hold the head in selected elevated position on the column.

6. A sprinkler as defined in claim 4 in which the means operatively to hold the sprinkler head in selected elevated position on the column comprises a sleeve-like member rotatably mounted on the column beneath the sprinkler head and supporting the same for rotation, there being downwardly opening slots in the sleeve corresponding in number and length to the desired vertical position of the sprinkler head relative to said annular water passage, and means on said column over which the slots are adapted selectively to be placed, thereby to hold the sleeve and therefore the sprinkler head at different elevated positions.

7. In a sprinkler, a stationary base portion having thereon a vertically disposed column, there being an annular water passage surrounding the column and having one edge contoured in four substantially equal size lobes, another edge contoured in alternately arranged large and small size lobes in which lobes of like size are spaced 180° apart, means to supply water to the annular water passage, a sprinkler head mounted for fluid tight rotation on the column about the annular passage and disposed to receive water from the annular passage, means operatively to hold the sprinkler head in selected elevated position on the column whereby the head receives water from the annular passage under the pattern determining influence of either the upper or lower edge of the passage or, selectively may be placed so that it receives water from the annular passage unaffected by the pattern determining edges of said passage.

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