

May 19, 1931.

W. VAN E. THOMPSON

1,806,101

TURBULENCE ARRESTER

Filed Nov. 30, 1927

Fig. 1.

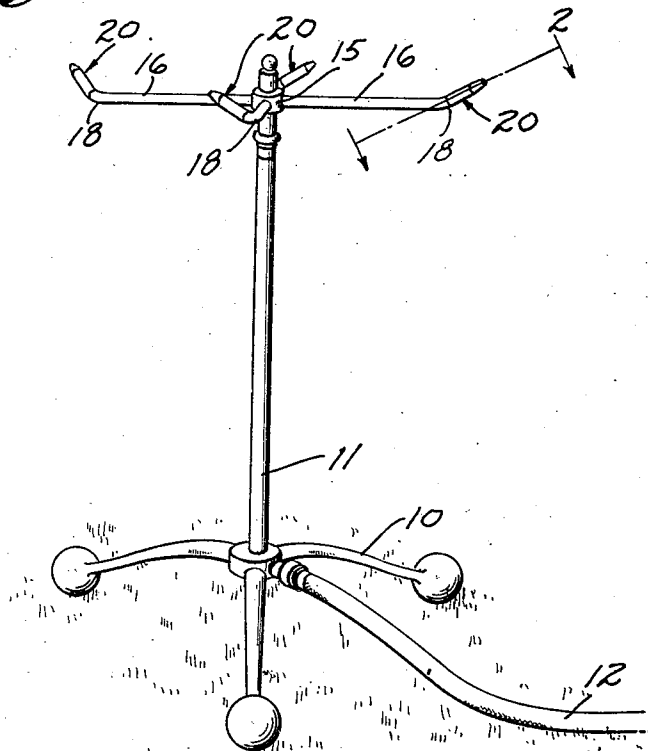


Fig. 3.

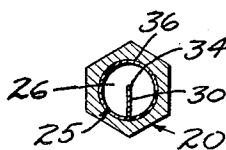


Fig. 2.

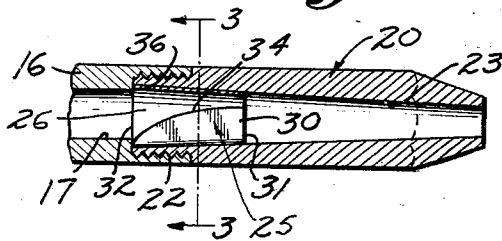
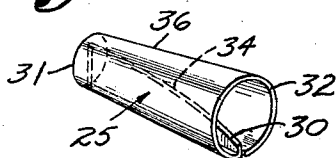


Fig. 4.



INVENTOR:
Walter Van E. Thompson,
BY

Fred W. Harris

ATTORNEY.

UNITED STATES PATENT OFFICE

WALTER VAN E. THOMPSON, OF LOS ANGELES, CALIFORNIA, ASSIGNOR TO THOMPSON MANUFACTURING COMPANY, OF LOS ANGELES, CALIFORNIA, A CORPORATION OF CALIFORNIA

TURBULENCE ARRESTER

Application filed November 30, 1927. Serial No. 236,748.

My invention relates to turbulence arresters, and more particularly to a turbulence arrester adapted to fit in a pipe of a rotary sprinkler.

Numerous types of sprinklers at present on the market have rotating arms through which the water is sprayed. Such a rotary movement is extremely advantageous in sprinkling large areas, and this rotation is usually derived from the water itself by changing the path of the stream of water just before it leaves the nozzle. This change in direction of the stream of water causes a reactional force on the arms which causes them to rotate. However, in changing the path of flow of any fluid, a certain turbulence is set up in the stream, and this turbulence dissipates a portion of the kinetic energy stored in the fluid stream. Such a turbulence also enlarges frictional losses between the water and the pipe, and also lowers the capacity of the pipe to carry the fluid. In rotary sprinklers, it is always desirable that this turbulence be eliminated, especially in sprinklers adapted to irrigate large areas. I have found that the stream of such a rotary sprinkler will carry from eight to ten feet more by eliminating the turbulence in the stream.

It is an object of my invention to provide a sprinkler in which the turbulence is reduced to a minimum, thereby increasing the efficiency thereof and the area sprinkled.

It is an object of my invention to provide a turbulence arrester which will not materially impede the flow of fluid passing it.

It is an object of my invention to provide a turbulence arrester which will not become clogged when in use, and which is self-cleaning.

A further object of my invention is to provide a type of turbulence arrester which is equally applicable for installation in small or large fluid passages.

It is an object of my invention to provide a nozzle construction having a removable turbulence arrester, which is readily installed and retained in place.

It is also an object of my invention to provide a turbulence arrester having an arcuated

portion and a fin extending inwardly therefrom.

A still further object of my invention is to provide a turbulence arrester having a peripheral portion consisting of substantially a frustum and an inwardly extending fin.

It is another object of my invention to provide a turbulence arrester of the character mentioned in which the fin has an edge which is inclined with respect to the axis of the passage through the turbulence arrester.

Referring to the drawings, Fig. 1 is a perspective view of a rotary sprinkler embodying the features of my invention.

Fig. 2 is a sectional view of the nozzle of the sprinkler shown in Fig. 1, this view being taken on the line 2—2 of Fig. 1.

Fig. 3 is a sectional view taken on the line 3—3 of Fig. 2.

Fig. 4 is a perspective view illustrating the turbulence arrester of my invention.

Referring particularly to Fig. 1, I illustrate one use of the turbulence arrester of my invention.

Here, a sprinkler standard 10 suitably supports a vertical pipe 11 in communication with a hose 12. At the upper end of the vertical pipe 11 is mounted a revolving socket 15 in fluid-tight relationship therewith. Extending outward from the socket 15 are arms 16 having openings 17 therethrough, these openings being in communication with the interior of the vertical pipe 11. At the outer end of each arm 16 a bend 18 is formed, and secured to the arm beyond this bend is a nozzle 20. Water entering the vertical pipe through the hose 12 is conducted through each of the arms 16 in a radial direction. The stream of water in each arm 16 is substantially stream-line in the radial portions of the arm, but when this stream reaches the bend 18 it is deflected, passing outward through the nozzles 20. This deflection of the stream of water passing through the arms 16 causes a reactional force on these arms which rotates them about the vertical pipe 11. This rotation is permitted by means of the pivotal connection between the revolving socket 15 and the pipe 11.

By thus changing the direction of flow of

the stream of water, a certain turbulence is created in the stream after it passes the bend 18. This turbulence is very undesirable for the reasons previously pointed out. Inas-
 5 much as it is desirable to have the nozzle 20 placed adjacent to the bend 18 in order that the greatest rotational force may be derived, this turbulence is not removed before the water passes through the nozzles 20. It is for
 10 accomplishing this purpose that the turbulence arrester of my invention has been designed.

Each nozzle 20 is threaded into the outer end of one arm 16 in a socket 22 therein, as
 15 indicated in Fig. 2. A converging fluid passage 23 is formed through the body of each nozzle 20, this fluid passage being in communication with the openings 17 of the arms 16. It should be noticed that the maximum di-
 20 ameter of the fluid passage 23 is adjacent the outer end of the arms 16 and that this maximum diameter is slightly larger than the diameter of the openings 17.

Adapted to tightly fit in the fluid pas-
 25 sage 23 is a member 25 incorporating the turbulence-arresting features of my invention. This member 25 is formed of a thin sheet of material which is bent into a frusto-conical shape, as indicated best in Fig. 4, this
 30 sheet of material defining and enclosing a converging turbulence-arresting chamber 26 extending longitudinally through the member 25. One edge of the sheet of material is bent inward to extend a distance across
 35 the turbulence-arresting chamber 26, this edge providing a fin 30. The distance that the fin 30 extends into the turbulence-arresting chamber 26 varies throughout the length
 40 of the member 25, as best indicated in Figs. 2 and 4. This fin is substantially wedge-shaped, and extends farther into the turbulence chamber 26 at an outer end 31 of the
 45 member 25 than it does at an inner end 32 of the member 25. It is essential that the apex end of the fin 30 be directed up-stream so that as the stream of water passes out-
 50 ward through the arms 16, the fin 30 projects more and more into the stream as the water passes through the turbulence-arresting chamber 26.

It should be noted that the fin 30 at no point extends entirely across the turbulence-arresting chamber 26. This is a very essen-
 55 tial feature of my invention, inasmuch as it prevents any clogging of the fluid passage. I have found that even though the water entering the hose 12 is carefully strained, an appreciable quantity of moss and other par-
 60 ticles is usually present. This moss would quickly clog the turbulence arrester of my invention if the fin 30 extended all the way across the turbulence-arresting chamber 26. By making the fin 30 wedge-shaped, I have
 65 found that no clogging will occur inasmuch as there is no face disposed at right angles

to the fluid flow on which the moss could accumulate. Any moss or particles flowing through the openings 17 would be gradually pushed along an inner edge 34 of the
 70 wedged fin 30 as they progress through the turbulence-arresting chamber 26 if these particles of moss should happen to be carried in such a position that they would hit the inner edge 34 of the fin.

The frusto-conical shape of the member 75 25 is also important inasmuch as the velocity of the water is increased as it passes there-through, thus still further tending to prevent any clogging of the turbulence-arresting chamber 26.

The turbulence-arresting member of my invention is extremely simple in design and is very easily installed by simply inserting the member in the end of the nozzle 20 and screwing this nozzle into the end of the arms 16, the end 32 of the member 25 being en-
 85 gaged by a suitable shoulder 36 of the arms 16, this engagement forcing the member 25 tightly into contact with the internal periph-
 90 ery of the fluid passage 23.

While I have described my turbulence arrester as being installed in a sprinkler, it should be understood that its utility is not limited to this field. Similar devices may be installed in pipe lines or other fluid passages
 95 where it is desired to eliminate turbulence. Furthermore, I am not limited to the exact shape of the fin 30 shown in the drawings. This fin may be as long as desired, and while I find it preferable to make this fin of very
 100 thin material, it is possible to increase this thickness without departing from the spirit of my invention.

The design of the turbulence arrester as an article of manufacture, as illustrated in Fig. 105 4, is an important part of the invention. It will be noted that the turbulence arrester is made from one piece of sheet metal bent into shape. A device of this character is very economical to manufacture and being made
 110 a separate part has the advantage of being removable, for the purpose of replacement or repair. The preferred form of turbulence arrester has a peripheral wall which is com-
 115 pletely or nearly completely annular in cross-section. This is not essential to the invention, however, since it is only necessary that the peripheral wall be of sufficient extension to have proper engagement with the wall of
 120 the passage to hold the turbulence arrester in place. Furthermore, it is not absolutely essential to the invention that the peripheral wall be frusto-conical. This is desirable, however, since it makes it possible to easily clamp the turbulence arrester in place.

Another important feature of the inven-
 125 tion is the manner in which the turbulence arrester is secured in place, as best shown in Fig. 2. The nozzle 20, which we designate in certain claims as a primary member, has a 130

passage provided with a frusto-conical portion in which the turbulence arrester is placed. The arm 16, which we designate as a secondary member, is adapted to be secured to the primary member or nozzle 20 so that the passage thereof is in communication with the passage of the nozzle. The secondary member or arm 16 has a shoulder which engages the adjacent end of the turbulence arrester and thus clamps it in the frusto-conical portion of the passage formed in the nozzle 20.

I claim as my invention:

1. A turbulence arrester adapted to be placed in a fluid passage to arrest turbulence, comprising a sheet formed to provide a frusto-conical wall and an inwardly extended fin, said fin extending in the direction of the axis of said wall.
2. A turbulence arrester adapted to be placed in a fluid passage to arrest turbulence, comprising a sheet formed to provide a frusto-conical wall and a radially inwardly extended fin, said fin extending in the direction of the axis of said wall.
3. A turbulence arrester adapted to be placed in a fluid passage to arrest turbulence, comprising: a thin sheet formed to provide a wall which is frusto-conical; and an integral fin extending inward from said wall, said fin being wedge-shape, the thin-end being near the base-end of said frusto-conical wall.
4. A turbulence arrester adapted to be placed in a fluid passage, said turbulence arrester being formed from a sheet of metal and comprising: a circumferential wall adapted to contact the wall of said fluid passage; and an integral fin bent inward from said circumferential wall, said fin being somewhat wedge-shaped and extending in the direction of the axis of said circumferential wall.

In testimony whereof, I have hereunto set my hand at Los Angeles, California, this 23rd day of November, 1927.

WALTER VAN E. THOMPSON.