June 3, 1924. 1,496,402

F. B. ALLEN

SPRINKLING SYSTEM AND SPRINKLER

Filed June 28, 1922 3 Sheets-Sheet 1

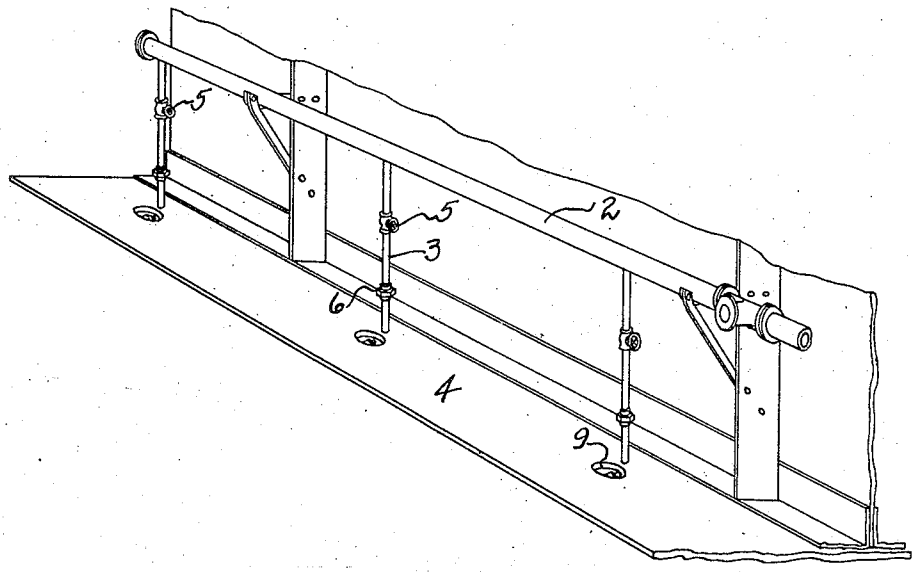

Fig. 1.

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BY Richey, Slough & Watts
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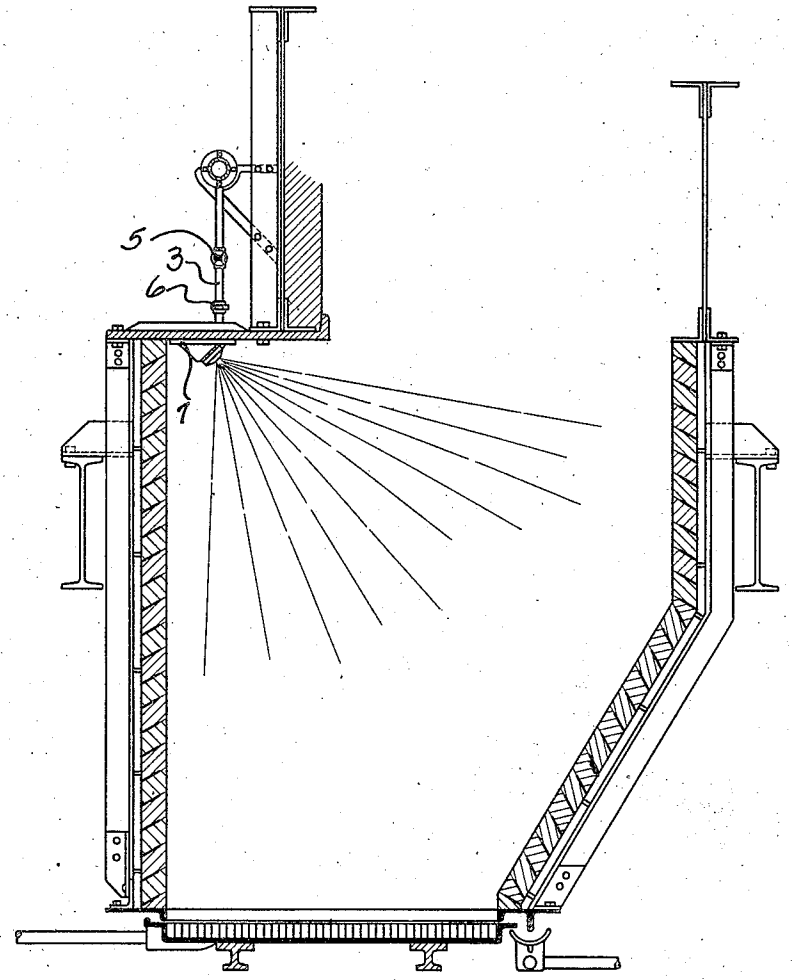

Fig. 2

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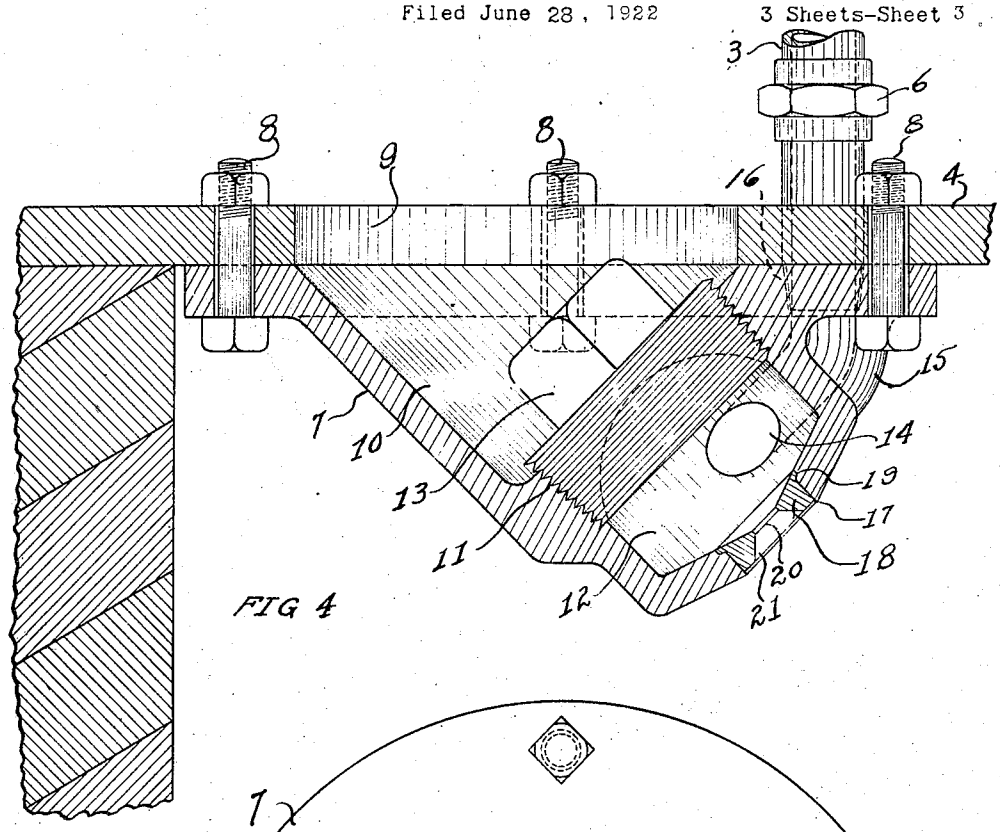

FIG 4

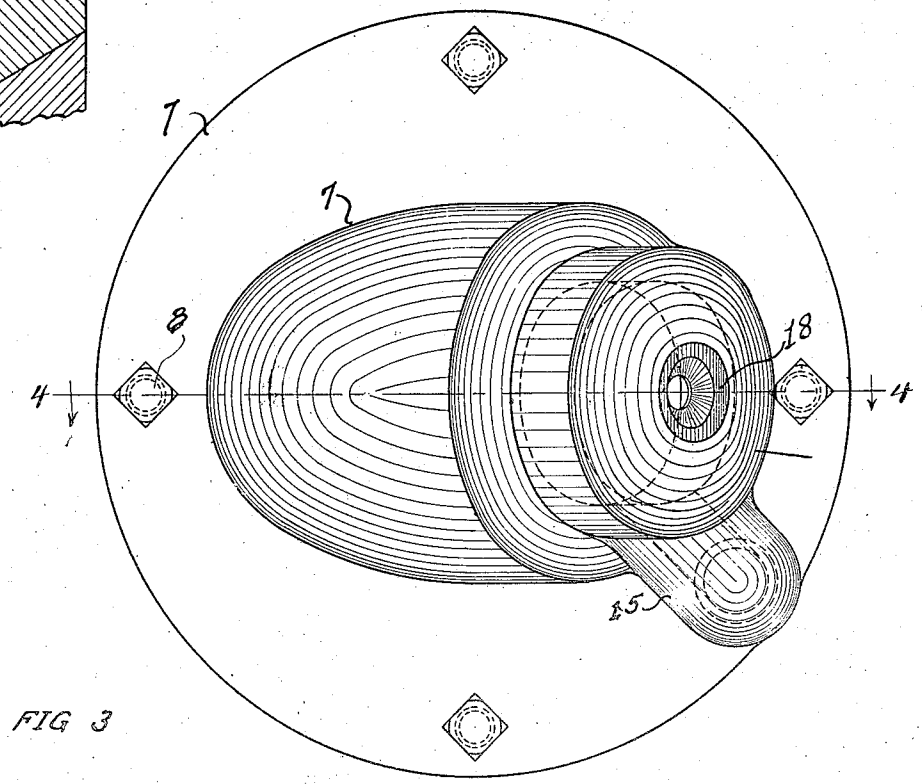

FIG 3

INVENTOR Frank B. Allen

ATTORNEYS Ricley Slough & Watts

Patented June 3, 1924. 1,496,402

UNITED STATES PATENT OFFICE.

FRANK B. ALLEN, OF PHILADELPHIA, PENNSYLVANIA.

SPRINKLING SYSTEM AND SPRINKLER.

Application filed June 28, 1922. Serial No. 571,405.

To all whom it may concern:

Be it known that I, FRANK B. ALLEN, a citizen of the United States, residing at Philadelphia, county of Philadelphia, and State of Pennsylvania, have invented certain new and useful Improvements in Sprinkling Systems and Sprinklers, of which the following is a full, clear, concise, and exact description, such as will enable others skilled in the art to which my invention appertains to make and use the same.

My invention relates to sprinkling systems in general and to sprinklers in general, but my invention is especially adapted for use in connection with ash hoppers associated with large furnaces.

Heretofore sprinkling systems and sprinklers have been used for wetting ashes and ash flues which are subject to a number of objections. For example, the water supplied from sprinklers has been delivered in such form as to form puddles in one place and leave dry areas at different points; also in the sprinkling systems used heretofore, the supply mains appear in the ash flues themselves.

Heretofore when the sprinkling orifices have become clogged, no provision has been made for remedying the defect, except by awkward and impractical methods, or by removing the sprinkler element; the orifices through which the water passes are not readily accessible for cleaning purposes and are not so constructed as to be adjustable.

Among the objects of my invention are—

To provide a sprinkling system in which the water pipes are not exposed to the heat of the ash hoppers or to the ashes.

To provide in a sprinkling system a sprinkler in which the interior thereof and the removable parts are accessible from the outside of the hopper wall regardless of the amount of ash in the hopper.

To provide in a sprinkling system of the above character an arrangement whereby each sprinkler may be disassociated from the sprinklers of the rest of the system.

To provide a sprinkler which may be opened from the rear for the purpose of removing clogging material, and for adjusting or replacing the removable nozzle.

To provide a sprinkler of the above character, the construction of which is such that the water is scattered in a manner to avoid puddling.

To provide other details of improvement tending to increase the efficiency and serviceability of a sprinkling system, and of sprinklers of the above character.

To accomplish the foregoing and other useful ends, my invention makes use of means hereinafter more fully set forth and claimed.

Referring to the accompanying drawings—

Fig. 1 shows the layout of a sprinkling system embodying my invention, and its relation to the boilers and ash hoppers, and the relation of the sprinklers to each other.

Fig. 2 is an end view of one of the sprinklers shown projecting into one of the ash hoppers, and showing the connection to the water main.

Fig. 3 is a bottom plan view of one form of the sprinklers, and

Fig. 4 is a section on line 4—4, Fig. 3.

Referring more in detail to the accompanying drawings, the water pipe 2 is shown in the room adjacent to the ash hoppers, which room is above the floor 4 below which the ash hoppers are located. From the water main 2 I show a series of taps or branches 3 extending from the water main to the individual sprinklers. In each of these branches are provided a shut-off 5 and a union 6. The frame 7 of the sprinkler is secured by bolts 8 to the under side of floor 4.

In the floor there is an opening 9 which registers with the open rear end of the frame 7 which communicates with the chamber 10 within the frame. This chamber 10, as will be seen, slants at an angle of approximately 45-degrees with the floor. The object of this construction is to dispose the sprinkler at this angle in order to facilitate the scattering of the water spray. This frame 7 is of reduced size at its lower end and is hollowed out to form a second chamber 12. Between this chamber and the chamber 10 there is a neck which is provided with threads 11, which threads are adapted to receive the plug 13 for shutting off the chamber 12 from the chamber 10. This plug may be either removed or screwed in position by inserting a suitable wrench or other device through the hole 9 in the floor.

It will be understood, of course, that a cover of any suitable character may be placed over the hole 9. Opening into the chamber 12 is a duct 14 which extends

through a spur 15 in the frame 7 and terminates in a threaded orifice 16. This orifice is located in juxta-position with an opening in the floor through which the branch pipe 3 leading to the water main extends, said branch pipe 3 being screwed to the sprinkler at the orifice 16.

In the forward or head end of the frame 7, I provide an orifice 17 in which is fitted a nozzle 18 having a flange in the upper side thereof that fits in a corresponding shoulder along the inner upper rim of the orifice 17. This nozzle is dished on the inner side with a slope terminating in an orifice 20, through which the water passes out from the chamber 12. From the hole 20 outward, there is a reverse slope toward the surface 21 of the nose piece. With this construction it will be seen that the water flows from the branch pipe 3 into the chamber 12. By disposing the duct 14 at an angle to chamber 12, a rotary motion is imparted to the water as it enters the chamber.

This rotary motion enables water to scatter as it leaves the orifice 20 much more effectively than would be otherwise the case.

It will be observed that the nozzle 18 is placed in position without any locking mechanism, the piece being held in place by reasonably close fitting and by pressure of the water from the rear. However, I contemplate the use of any suitable holding arrangement such as screw threads or the like wherever necessary. The object in leaving the nozzle without any locking mechanism is to facilitate the ready removal thereof. I also contemplate the substitution of one nozzle for another whenever a change in the size of the orifice 20 is deemed necessary due to variations in pressure of the water, or due to the necessary increase in the normal discharge of the sprinkler.

It will be seen that with the construction and arrangement shown and described, I provide a highly efficient sprinkling system and sprinkler. The arrangement provides means whereby the water may be cut off from any individual sprinkler whenever necessary, as for example, for the purpose of adjustment or for the purpose of cleaning any obstruction that may have crept into the chamber 12 or into any part of the sprinkler, or for changing the nozzle. This can all readily be done by shutting off the water at the shut-off 5, and by removing the plug 13 by way of the hole 9 in the floor.

After the necessary cleaning, adjusting or substituting operation has taken place, the plug 13 is restored to close up the chamber 12.

What I claim as my invention is—

1. In a sprinkler system for ash hoppers, in combination, an ash hopper, a wall covering a portion thereof, a sprinkler in the hopper secured to the said wall and a source of sprinkling fluid outside the said hopper and connected to the said sprinkler, the interior of the said sprinkler being accessible thru the said wall from outside the hopper.

2. A sprinkler for an ash hopper comprising a hollow frame member open at the rear end and having side walls and a front end wall, the said side walls having an inlet opening adjacent to the end wall and the said end wall having an outlet opening therethrough; means removably accessible through the open rear end of the said member for forming a chamber between itself, the side walls and the front end wall; and a nozzle mounted in the outlet opening in the said end wall and removably accessible through the rear open end of the said frame member.

3. A sprinkler for an ash hopper comprising a hollow frame member open at its rear end and having side walls and a front end wall, the said side walls having an inlet opening formed adjacent to the end wall and the end wall having an outlet opening formed therethrough; a nozzle in the said outlet opening; a plug fitting the interior of the said hollow member intermediate the ends thereof, the said nozzle and plug each being removably accessible through the open rear end of the said frame member.

4. A sprinkler for an ash hopper comprising a hollow frame member having an end wall provided with an outlet opening and side walls provided with an inlet opening adjacent to the said end wall; a nozzle mounted in the opening in the end wall; a plug engaging the side walls rearwardly of the said inlet opening and constituting a wall across the interior of the said frame member, the frame member being open at its rear end; the said nozzle and plug being removably accessible through the said open rear end of the frame member.

5. In combination with an ash hopper wall having an opening therein, a frame member adapted to be secured to the said wall within the hopper, the frame member having an open end chamber in the rearward portion thereof adapted to cooperate with an opening in the said ash hopper wall, and having also a chamber in the forward end of the side frame, means separating the chambers in the rearwardly extending and forward portions of the said frame member, said means being accessible through the said opening in the hopper wall, a liquid inlet into the forward chamber and an outlet therefrom.

6. In combination with an ash hopper wall having an opening therein, a sprinkler adapted to be secured to the said wall within the said hopper adjacent to said opening and comprising a frame member having an opening extending therethru, a plug within the opening intermediate of the

length of the frame, the said plug being removably accessible through the said opening in the hopper wall, an inlet duct leading to the interior of the frame member, and a removable nozzle in the said frame member constituting an outlet from the interior thereof.

7. A sprinkler for an ash hopper comprising a cup-like frame member having its open end edge inclined at an angle to the longitudinal axis thereof, a plug within the frame member having screw threaded engagement with the walls thereof, the said plug forming a fluid receiving chamber in the frame member, the said chamber having an inlet at one side adapted to discharge fluid tangentially thereinto, the chamber also having an outlet opening formed with conical walls whereby the fluid is discharged from the chamber without having its circumferential motion interrupted.

8. In combination with an ash hopper having a wall provided with an opening, a sprinkler adapted to be secured to the said wall and comprising a hollow frame member having an opening cooperating with the opening in the said hopper wall; a plug within the frame member intermediate the length thereof, the said plug being removably accessible from outside the hopper; an inlet duct leading to the interior of the frame member, and an outlet in the said frame member opening from the interior thereef into the said hopper.

9. In combination with an ash hopper having a wall provided with an opening, a sprinkler adapted to be secured to the said wall to cooperate with the said opening; the said sprinkler comprising a hollow frame member open at its rear end and provided with liquid inlet and outlet openings through the walls thereof, means forming a wall across the interior of the said frame member intermediate its ends and rearwardly of the said inlet and outlet openings, and an inlet duct leading to the said inlet opening, the said wall forming means being removably accessible through the rear open end of the said frame member.

In witness whereof, I have hereunto signed my name this 22nd day of June, 1922.

FRANK B. ALLEN.