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SPRINKLER SYSTEM FOR CHIMNEYS

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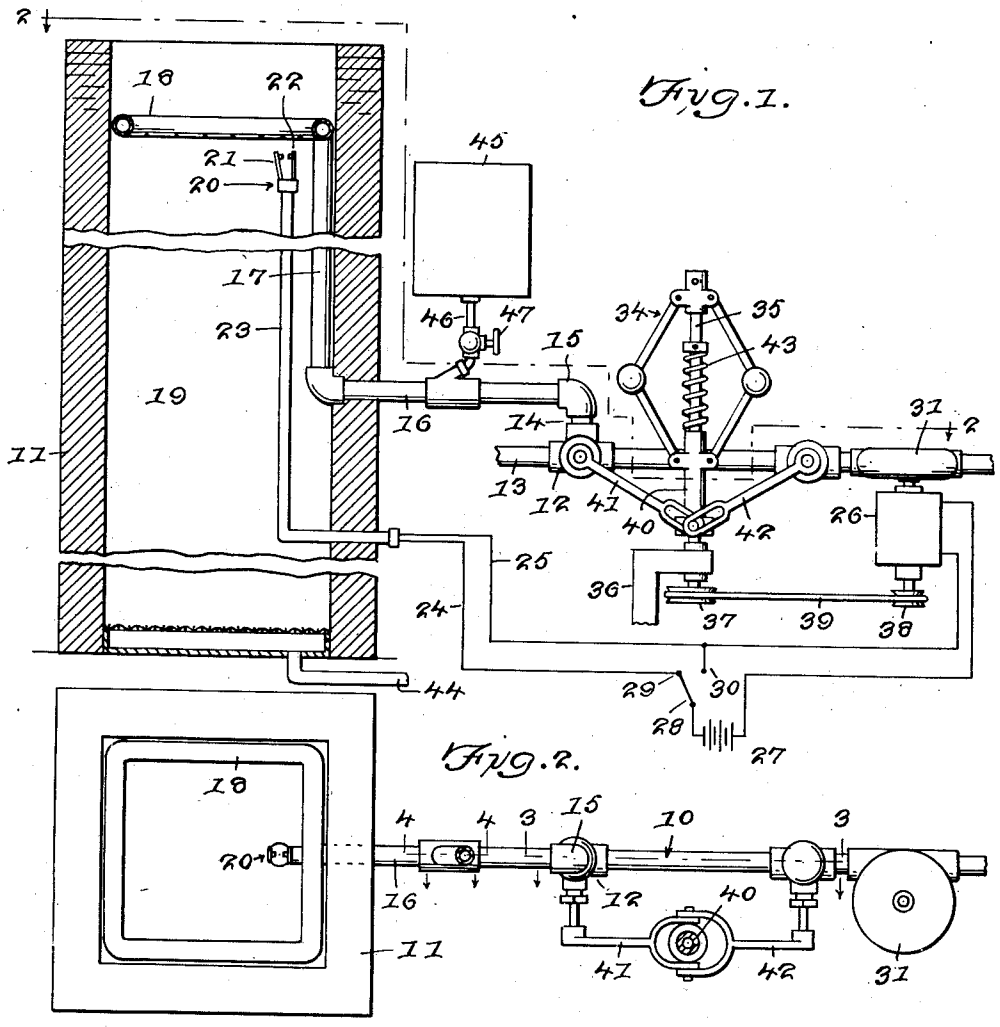


Fig. 1.

Fig. 2.

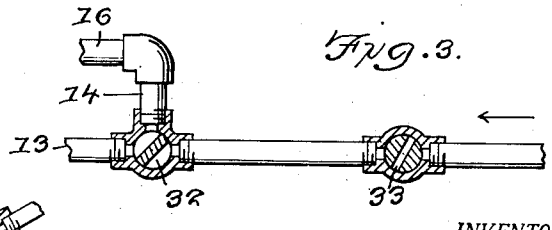


Fig. 3.

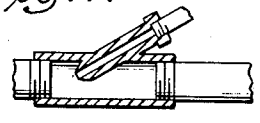


Fig. 4.

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SPRINKLER SYSTEM FOR CHIMNEYS

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5 Claims. (Cl. 169—2)

My invention relates to new and useful improvements in sprinkler systems for chimneys.

An important object of my invention is the provision of a sprinkler system for chimneys which will be automatically rendered operative by the excessive heat caused by a fire in the chimney to spray water or other fluid into the chimney to extinguish the fire.

Another object of my invention is the provision of a device of the above mentioned character that is simple in construction, efficient and efficacious in the performance of its duties and inexpensive to manufacture and install.

Other objects and advantages of my invention will be apparent during the course of the following description.

In the drawing, forming a part of this specification, and wherein like numerals are employed to designate like parts throughout the same,

Figure 1 is a side elevation of a sprinkler system embodying my invention and showing the same operatively installed in a chimney,

Figure 2 is a transverse sectional view taken on the line 2—2 of Figure 1,

Figure 3 is a fragmentary vertical sectional view taken on the line 3—3 of Figure 2, parts being shown in section and parts in elevation for clearness of illustration, and

Figure 4 is a fragmentary vertical sectional view taken on the line 4—4 of Figure 2.

In the accompanying drawing, wherein for the purpose of illustration, is shown a preferred embodiment of my invention, the numeral 10 designates a pipe line or conduit which extends from a source of fluid pressure such as a conventional water line, or the like, and into a chimney 11. Prior to its entrance into the chimney the conduit is provided with a key connection 12. A pipe 13 connected to one of the horizontal flanges of the connection extends through a suitable drain and short length of conduit 14 is provided with an elbow union 15 at its upper end which connects with a horizontally arranged conduit 16. This arrangement located the section of conduit 16 above and parallel to the main conduit 10 and the conduit 16 therefore enters the chimney slightly above the level of the main conduit. Within the chimney the conduit 16 extends upwardly along one wall of the chimney as at 17, which portion 17 terminates adjacent the top of the chimney in a perforated annular section of tubing 18. The section 18 is shaped to conform with the passage 19 of the chimney whereby it will extend in close proximity with the walls of the passage and by reason of its annular formation it will afford little or no obstruction to the passage of smoke and gases through the chimney. The perforations in the section 18 are directed downwardly so that water or other fluid discharged therefrom will be directed downwardly into the chimney in a fine even spray.

Fluid is discharged into the chimney only upon the occurrence of a fire therein and I have therefore provided a thermostatic unit 20 in the chimney which will be responsive to an excessive temperature in the chimney to turn on the sprinkler system. The thermostatic unit comprises a pair of normally separated bi-metallic arms 21 and 22 connected to a vertically arranged pipe section 23. The pipe section 23 extends upwardly within the chimney to position the arms 21 and 22 at the upper end thereof and in proximity to the annular spray section 18. I prefer that the pipe section 23 be suitably insulated so that the electrical conductors 24 and 25 extending therethrough and connecting with the bi-metallic arms 21 and 22 will be shielded from the flames of a fire within the chimney. As best illustrated in Figure 1 the lower end of the pipe 23 extends outwardly through the wall of the chimney, the conductors 24 and 25 extending therefrom and connecting with an electric motor 26. The battery 27 or other suitable source of electric power is connected in the circuit, the same being here illustrated as being connected in the conductor 24. A switch arm 28 is inserted in the conductor 24 which arm is swingable between a contact 29 on the conductor 24 and a contact 30 on the conductor 25. It will be observed that the switch arm is located intermediate the battery and the thermostatic unit 20. To permit the motor 26 to be operated independently of the thermostatic unit, if desired. It may thus be seen that the electric circuit hereinabove described is provided with two switches, i. e., the thermostatic unit 20 and the switch arm 28. If the switch arm 28 is in engagement with the contact 29 the motor may only be energized by movement of the bi-metallic arms 21 and 22 of the thermostatic switch into engagement with each other. By reason of the temperature responsive characteristic of the thermostatic unit the arms 21 and 22 will only contact when excessive heat is developed within the chimney as in the case of a fire. If however, the switch arm 28 is moved into engagement with the contact 30 a new circuit will be formed which extends direct from the battery to the motor. In the operation of the appara-

tus the switch arm 28 is normally maintained in engagement with the contact 29 so that the motor will not be energized unless the thermostatic switch is closed.

In some instances, it may be necessary to supply the water of the conduit 10 by means of a storage tank or the like and under these conditions I connect one end of the armature shaft of the motor to a suitable impeller unit 31 which is connected in the conduit 10 for developing a hydrostatic pressure therein. It may be desirable to provide the impeller unit 31 even though the conduit 10 is connected to a conventional water main of the type wherein the water normally flows under pressure. Under these conditions the impeller will serve as a booster for forcing the water within the conduit to the top of the chimney so that it may be discharged through the section 18.

I have provided a drain valve 32 at the juncture of the drain pipe 13 with the conduit 10 and a shut-off or check valve 33 intermediate the drain valve and the impeller 31. It will be noted that the drain valve is thus located below the conduit 16 so that the liquid therein and within the upstanding portion thereof 17 may drain by gravity therefrom. The drain valve is normally opened to permit the fluid to drain from this portion of the conduit and the check valve 33 is normally closed to prevent fluid from the fluid source from having access to the conduit 16.

The valves 32 and 33 are automatically operated upon closing of the thermostatic switch 20 by means of a governor 34 the main rod 35 of which is rotatably supported by the bracket 36. A pulley 37 is fixedly attached to the governor rod 35 and a pulley 38 is fixedly attached to the armature shaft of the motor 26 so that the endless belt 39 connecting the pulleys will drive the governor when the motor is energized. The sleeve 40 of the governor has a pin and slot connection with one end of each of two operating levers 41 and 42. The opposite end of the levers connect with the valves 32 and 33, respectively. Thus, the main rod of the governor is rotated by the motor, the governor weights will fly outwardly by centrifugal action to slide the sleeve 40 upwardly on the rod 35 against the resilient action of a coil spring 43. As the sleeve 40 slides along the governor rod the pin carried thereby will move within the slot of the levers 41 and 42 and swing the connecting ends of the levers upwardly to open the check valve 33 and to close the drain valve 32. When the check valve 33 is open the fluid from the fluid source may flow through the conduit 10 upwardly through the conduit 14 and through the conduit 16 to the spraying head 18.

It may thus be seen that the occurrence of a fire in the chimney will cause the bi-metallic arms 21 and 22 of the thermostatic unit 20 to contact whereby to close the circuit from the battery through the motor 26. As soon as the motor is energized the governor will be driven to open the valve 33 and to close the valve 32. The water or other fluid traversing the conduit may then have access to the spring head 18 of the apparatus which will direct the same downwardly into the chimney in a fine even spray. The flow of the fluid through the conduit will be permitted as long as the excessive heat remains in the chimney. As soon as the fire is extinguished, the temperature within the chimney will be lowered and the thermostatic switch 20 will open to prevent electric current from flowing from the battery to the motor. As soon as the motor ceases to operate the governor 34 will cease to operate the coil spring 35 which will return the sleeve 40 to the initial position whereby to close the check valve 33 and to open the drain valve 32. As soon as the fluid is prevented from flowing past the check valve 33 the fluid within the conduit sections 16 and 17 may drain therefrom through the drain pipe 13.

It is also desirable that the bottom of the chimney be provided with a suitable drain pipe 44 so that the water discharged into the chimney may drain therefrom.

It is sometimes necessary to clean the chimney and a mixture of acid and water is generally used for this purpose. The instant apparatus may also be used to clean the chimney. A tank 45 containing acid or the like is mounted above the conduit 16 and is connected thereto by means of a pipe 46. A manually operated check valve 47 is connected in the pipe 46 to normally prevent the acid in the tank from flowing therefrom.

When it is desired to clean the chimney in the above described manner, the check valve 47 is opened to permit the acid within the tank 45 to flow into the conduit 16 and the switch arm 28 is moved out of engagement with the contact 29 and into engagement with the contact 30. The motor 26 will then be energized to operate the governor 34 and to open the check valve 33 and to close the drain valve 32. Water from the fluid source may then flow through the conduit 10 and into the conduit 16 where it will be mixed with the acid gravitating from the tank 45 and the mixture of water and acid will flow through the conduit 17 and be discharged from the spray head 18 and into the chimney.

After the chimney has been thoroughly cleaned the check valve 47 is closed and the switch arm 28 is returned to the initial position to engage the contact 29. The governor will then automatically close the check valve 33 and open the drain valve 32. It may thus be seen that after the cleansing operation is complete the system is again automatically set to operate in the event of a fire in the chimney.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that various changes in the size, shape and arrangement of parts may be resorted to without departing from the spirit of my invention or the scope of the appended claims.

Having thus described my invention, I claim:

1. An automatic sprinkler system for chimneys comprising a fluid source, a conduit extending from the source and discharging into the chimney, a normally open electric circuit, temperature responsive means disposed within the chimney and connected in said circuit, said means being operative to close the circuit when the heat within the chimney reaches a determined maximum, a normally closed check valve within the conduit, and means rendered operative by the closing of the circuit to open the said check valve.

2. An automatic sprinkler system for chimneys comprising a fluid source, a conduit extending from the fluid source and discharging into the chimney, a normally open electric circuit, temperature sensitive means disposed within the chimney and connected in said circuit, said means being operative to close the circuit when the heat within the chimney reaches a determined maximum, a normally closed check valve within the conduit, a normally open drain valve in said con-

duit intermedate the check valve and the discharge end of the conduit, and means rendered operative by the closing of the circuit to open the said check valve and to close the drain valve.

3. The combination as set forth in claim 1 wherein the last mentioned means comprises a motor connected in the circuit, a governor driven by the said motor, and means coactive with the governor and valve to open the valve upon actuation of the governor.

4. The combination as set forth in claim 2 wherein the last mentioned means comprises a motor connected in the circuit, a governor driven by the motor, and levers coactive with the governor and valves to open the check valve and close the drain valve upon actuation of the governor.

5. The invention described in claim 1 wherein there is provided a fluid impeller interposed in said conduit and operatively connected with said last-mentioned means to place the fluid under sprinkling pressure.

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