A. B. HAMIL, A. O. VENSEL & F. S. BERGSTROM.

HOUSE VENTILATING AND FIRE EXTINGUISHING SYSTEM.

APPLICATION FILED SEPT. 29, 1916.

1,264,066.

Patented Apr. 23, 1918.

3 SHEETS—SHEET 1.

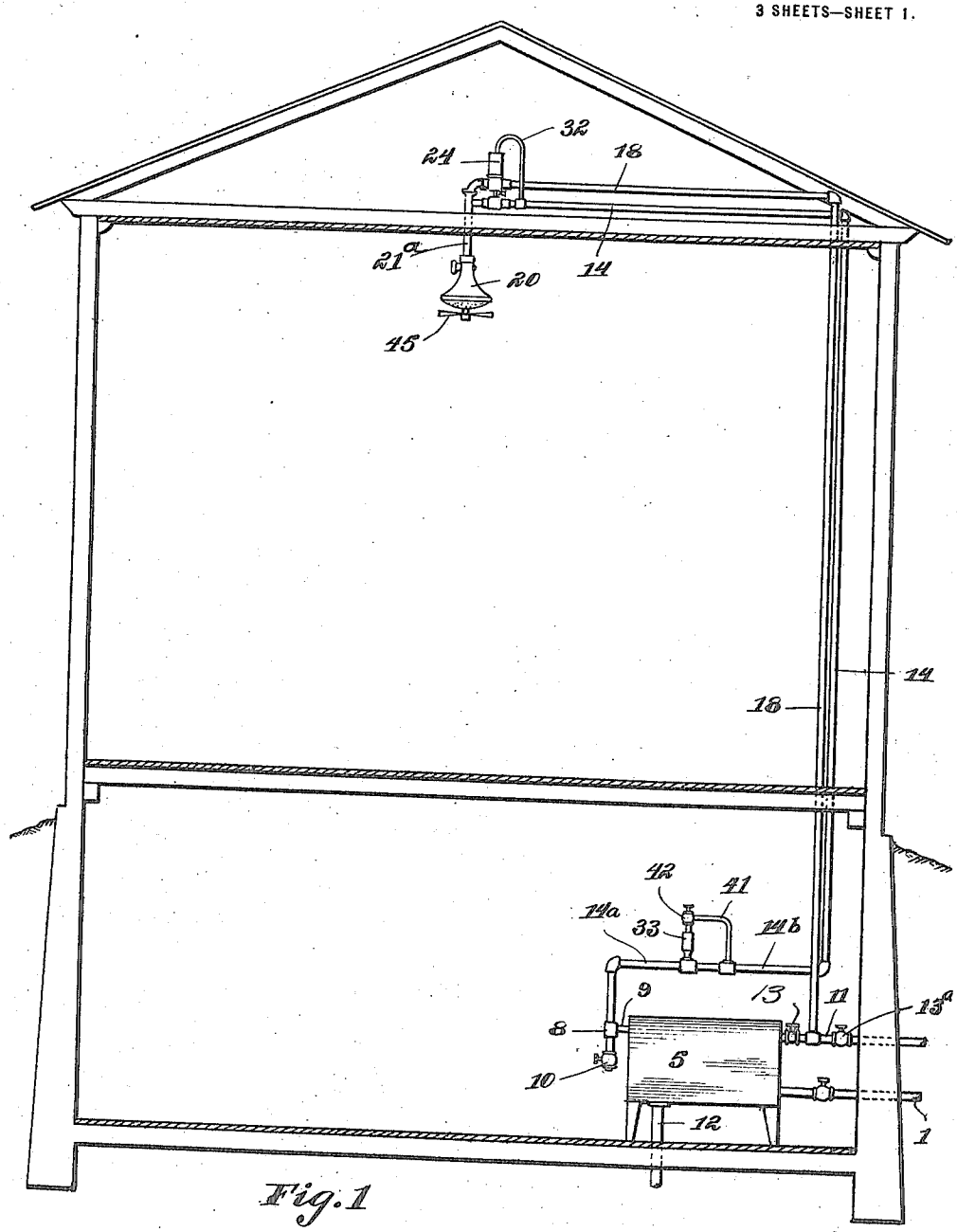

Fig. 1

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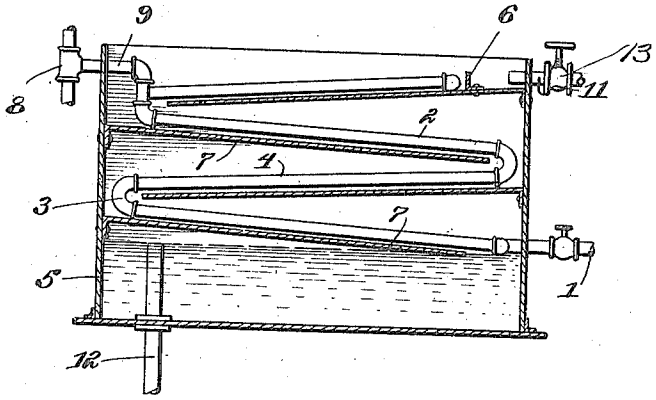

Fig. 2

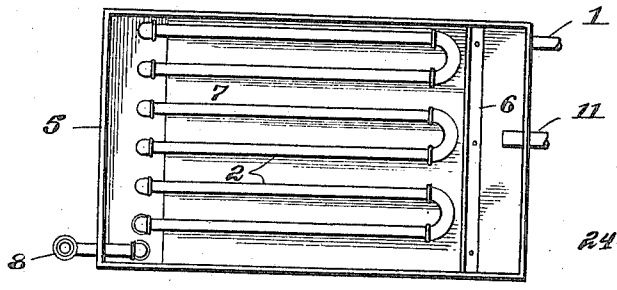

Fig. 3

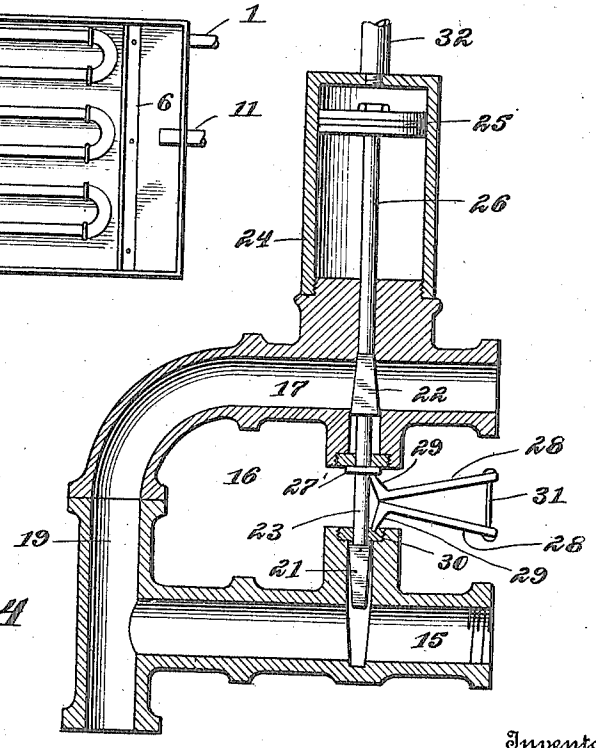

Fig. 4

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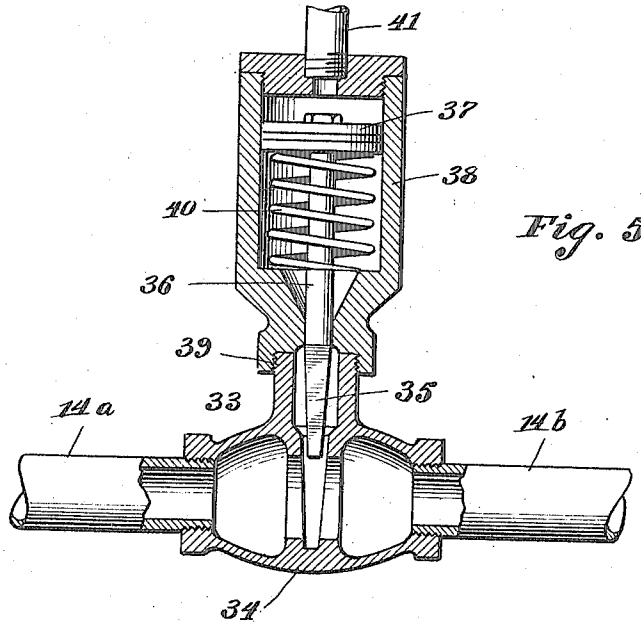

Fig. 5

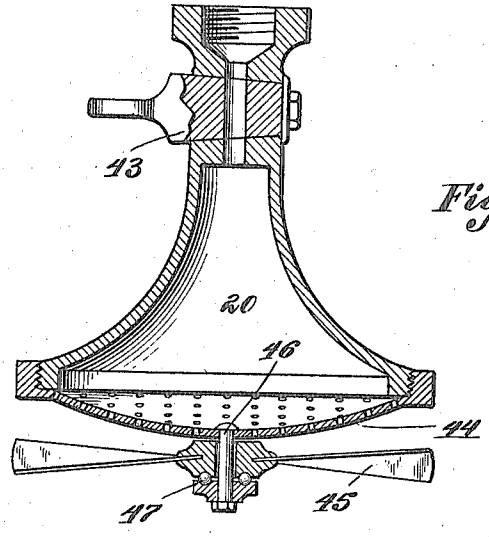

Fig. 6

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UNITED STATES PATENT OFFICE.

ANDREW B. HAMIL, ANDREW O. VENSEL, AND FRANK S. BERGSTROM, OF RAY, ARIZONA.

HOUSE-VENTILATING AND FIRE-EXTINGUISHING SYSTEM.

1,264,066. Specification of Letters Patent. Patented Apr. 23, 1918.

Application filed September 29, 1916. Serial No. 122,893.

To all whom it may concern:

Be it known that we, ANDREW B. HAMIL, ANDREW O. VENSEL, and FRANK S. BERGSTROM, citizens of the United States, residing at Ray, in the county of Pinal and State of Arizona, have invented new and useful Improvements in House-Ventilating and Fire-Extinguishing Systems, of which the following is a specification.

Our invention is an improved ventilating and fire extinguishing system for use in dwellings and other structures and adapted for use in connection with water distributing pipes of a city or individual water plant and also for use in connection with an air compressing and air distributing system, the object of the invention being to provide an improved apparatus of this kind by means of which compressed air is water cooled, is supplied to and distributed through the house in which the system is installed and by means of which, in the event of fire, the supply of compressed air is automatically cut off and water under pressure is discharged at the point where the fire occurs so that the fire is extinguished and is prevented from spreading.

The invention consists in the features of construction, combination, and arrangement of devices, hereinafter fully described and claimed.

Figure 1 is a diagrammatic elevation of a ventilating and fire extinguishing system constructed and arranged in accordance with our invention showing the same installed in a dwelling.

Fig. 2 is a detail vertical sectional view of the compressed air cooler.

Fig. 3 is a plan of the same.

Fig. 4 is a detail sectional view of the fire valve for automatically cutting off the compressed air and for automatically turning on the water in the event of fire.

Fig. 5 is a similar view of the air pressure regulating valve.

Fig. 6 is a similar view of one of the sprinklers.

In the embodiment of our invention, we provide a compressed air supply pipe 1 which leads from a suitable air compressing apparatus or plant which may be of any suitable size and capacity. This pipe leads to cooling coils 2 which include returns 3 and provide a series of superposed oppositely inclined sections 4 which are arranged in a tank 5. The tank is provided near its upper side with a spill board 6 and is also provided with a series of oppositely inclined flow boards or baffles 7, one of which is arranged under each section of the cooling coils as shown. A T 8 is connected by a nipple 9 to the discharge end of the cooling coils and is provided at its lower arm with an air drain arm 10 which is normally closed. A water supply pipe from any suitable tank, source of water or city water distributing system, is connected to the upper portion of the tank 5 as at 11 to discharge water onto the uppermost flow board and the spill board 6 so that water is caused to flow downwardly and around the sections of the compressed air cooler. The water escapes from the tank through an overflow pipe 12, the upper end of which is open and is spaced a suitable distance from the bottom of the tank as shown in Fig. 2. The water, when the system is in operation, flows continuously and the water supply may be regulated by a valve 13 with which the pipe 11 is provided. Said valve should be arranged to permit only a small, but continuous supply of water to the tank as this is all that is required for air cooling purposes.

A compressed air distributing pipe 14 leads from the T 8 to a point above the ceiling of a room. Any suitable number of such pipes may be used. Only one is here shown as this is all that is necessary for the purpose of this specification. The pipe 14 is connected to the air duct 15, of a fire valve 16, said fire valve also having a water duct 17 which is connected by a pipe 18 to the water intake pipe 11. The air duct 15 and duct 17 of the fire valve have a common discharge 19 to which a sprinkler 20 is connected as by means of a nipple or short pipe 21^a.

A cut-off valve 13^a is also in practice provided for the pipe 11. This valve is normally kept open to the full extent.

A cut off 21 is provided for the air duct and a cut off 22 is provided for the water duct, the said cut offs being connected to a common operating rod 23 and being so spaced and arranged, that when one is in open position, the other is in closed or cut off position. Normally, the air cut off 21 is in open position and the water cut off 22 is in closed position as shown in Fig. 4. A cylinder 24 is provided which is here shown as screwed on the upper side of that portion of the body of the fire valve provided with the water duct and in this cylinder is a pis-

ton 25 which is connected to an upper extension 26 of the cut off rod 23. The said cut off rod has a stop 27 below the water duct. A pair of reversely arranged substantially L-shaped strut levers 28 are provided, one of which is arranged with its foot 29 engaged under the stop 27, the foot of the other lever bearing on the portion of the fire valve in which the air duct is located, as indicated at 30. The said levers are arranged with their inner ends in contact with each other and their outer ends spaced apart. A fusible link 31 connects the outer ends of said strut levers and normally holds them in the position herein described and shown in Fig. 4, so that normally the air duct of the fire valve is open and the water duct thereof is closed. A pipe 32 provides air connection between the upper end of the cylinder 24 and the compressed air distributing pipe 14.

The air distributing pipe 14 is provided with a compressed air regulating valve 33 which is shown in detail in Fig. 5. The body of the valve is shown at 34, its ends are connected to sections 14^a, 14^b of the air distributing pipe. A cut off 35 is provided which is normally open and has a rod 36 to the upper end of which a piston 37 is attached, said piston operates in a cylinder 38 which is screwed to the valve body as at 39 and is normally held in raised position, to keep the cut off 35 in open position, by means of a spring 40. A pipe 41 connects the upper end of the cylinder with the section 14^b of the air distributing pipe and is provided with a controlling valve 42 which may be opened to any desired extent, according to the desired pressure through the air distributing pipe. In the event this pressure is exceeded, the piston 37 will be depressed against the tension of the spring 40 to entirely or partly close the cut off 35 as may be required and when the pressure diminishes, the said spring restores the piston and hence the cut off to normal position.

The sprinkler 20 has a cut off plug 43 which is normally open and also has a rose 44. A revoluble fan 45 is arranged below the rose and revolves on a vertically arranged axle 46, the upper end of which is attached to the center of the rose. A ball bearing 47 is provided for the fan as shown.

In the normal operation of the system, the compressed air which is discharged into the room from the sprinkler, causes the fan to rotate, so that the compressed air is distributed throughout the room and currents of air are set up in the room by the action of the fan, the compressed air having been cooled in the cooling coils is very refreshing and the ventilation afforded by the discharge of the cooled and compressed air into the room is complete.

In the event of a fire, the fusible element 31 is fused by the heat, releases the strut levers 28 which hence become disconnected and drop from the air valve thus releasing the rod 23. The air pressure in the cylinder 24 above the piston, serves to depress the latter, thus simultaneously and automatically closing the air cut off 21 and opening the water cut off 22. Hence the sprinkler becomes instantly supplied with water instead of compressed air and the rose, in connection with the revolving fan 45 causes all the parts of the room in the vicinity of the sprinkler to be thoroughly sprinkled with water, thus effectually extinguishing the fire and preventing the fire from spreading.

Having described the invention, what is claimed is:

1. A ventilating and fire extinguishing system including compressed air conducting means, water conducting means, means to cut off the compressed air conducting means, means to cut off the water conducting means, means including a fusible member to normally hold the air cut off means in open position and the water cut off means in closed position, and fluid pressure actuated means to close the said air cut off means and open the said water cut off means, when said fusible element is fused.

2. A ventilating and fire extinguishing system including compressed air conducting means, water conducting means, means to cut off the compressed air conducting means, means to cut off the water conducting means, means including a fusible member to normally hold the air cut off means in open position and the water cut off means in closed position, and fluid pressure actuated means common to said cut off means to close the said air cut off means and open the said water cut off means, when said fusible element is fused.

3. A ventilating and fire extinguishing system, including a sprinkler, means to discharge compressed air through the sprinkler, means to discharge water through the sprinkler, means to cut off the supply of compressed air to the sprinkler, means to cut off the supply of water to the sprinkler, means including a fusible element to normally hold the air cut off means in open position and the water cut off means in closed position, and means common to said cut off means to close the air cut off means and open the water cut off means when said fusible element is fused.

4. A ventilating and fire extinguishing system including compressed air conducting means, water conducting means, means to cut off the supply of compressed air, means to cut off the supply of water, means including a fusible element to normally hold the air cut off means in open position and the water cut off means in closed position, and

means common to said cut offs to close the air cut off and open the water cut off when said fusible element is fused.

5. A ventilating and fire extinguishing system including compressed air conducting means, water conducting means, a cut off for the air conducting means, a cut off for the water conducting means, means controlled by heat to normally hold the air cut off in open position and the water cut off in closed position and means effective upon the operation of said heat controlled means to close the air cut off and open the water cut off.

In testimony whereof we affix our signatures.

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FRANK S. BERGSTROM.