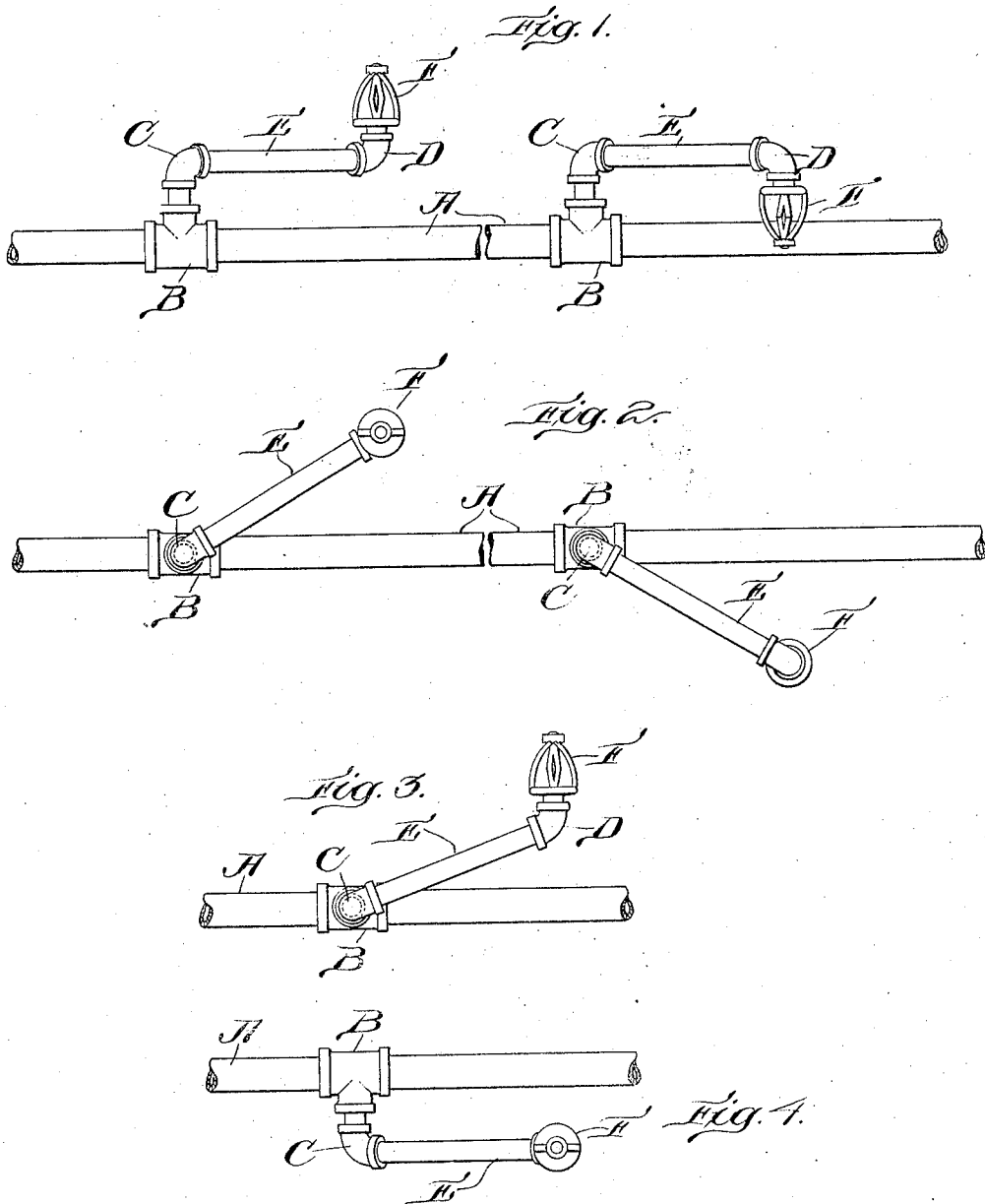


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 COMBINED WATER HEATER AND SPRINKLER SYSTEM.
 APPLICATION FILED DEC. 7, 1911.

1,058,968.

Patented Apr. 15, 1913.



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UNITED STATES PATENT OFFICE.

WILBERFORCE BEECHER HAMMOND, OF BROOKLINE, MASSACHUSETTS.

COMBINED WATER-HEATER AND SPRINKLER SYSTEM.

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Specification of Letters Patent.

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Application filed December 7, 1911. Serial No. 664,435.

To all whom it may concern:

Be it known that I, WILBERFORCE BEECHER HAMMOND, a citizen of the United States, and resident of Brookline, in the county of Norfolk and State of Massachusetts, have invented new and useful Improvements in Combined Water-Heater and Sprinkler Systems, of which the following is a specification.

10 My invention relates to combined water heating and sprinkler systems such as have recently been proposed and by means of which a single system of piping installed near the ceiling of apartments to be heated, 15 is availed of also to perform the duty of a fire extinguishing system controlled in case of emergency by the automatic operation of sprinkler heads.

In order completely to satisfy the requirements of fire underwriters, sprinkler heads should be so constituted as to release water when the temperature of the sprinkler heads rises to about 160° F. On the other hand in order to heat large apartments such as 25 mill or factory rooms, effectively by hot water it is desirable and in many cases necessary to carry water through the pipes of the heating system at an entrance temperature of 212° F. or even as high as 220° F. 30 Therefore the installation of sprinkler heads of the standard type in water heating systems in close proximity to the water heating pipes, particularly in locations immediately above such heater pipes introduces an 35 element of danger by necessarily maintaining the sprinkler heads at a temperature uncomfortably close to that at which they are set to release. The dangers incident to such situations are considerable since as is 40 well known, water damage often exceeds damage directly attributable to fire.

I am aware that previously to my invention herein described it has been proposed to apply sprinkler heads to vertical offsets 45 joined to a hot water circulating pipe, but I have observed by experiment and practice that in such constructions the temperature of the sprinkler heads always rises to and frequently beyond the releasing temperature 50 whenever the water in the heater pipe is raised to a temperature effective for heating purposes.

As will be more particularly described herein, I have discovered that if the sprinkler offsets in a hot water circulating pipe 55 are so constructed that the sprinkler head

at the dead-end of such an offset is at a horizontal distance measured along the pipe connection whether this be straight or curved, from the junction with the circulation pipe which is decidedly in excess of its vertical displacement therefrom, communication of heat by circulation in the offset itself is practically cut off, and the heat insulating effect of trapped gases in the 60 offsets rendered effective to maintain the temperature at the sprinkler head at a safe point, though that of the circulating water in the circulation pipe be carried to the practical highest limit. 70

In the drawings hereto annexed which illustrate examples of my invention,—Figure 1 is a view of portions of a combined water heater and sprinkler system in elevation; Fig. 2 is a plan view of the system 75 illustrated in Fig. 1; Fig. 3 shows a modification of my improvements in elevation; and Fig. 4 shows the same in plan view.

Referring to Figs. 1 and 2; A represents a heater pipe to carry hot water into circulation, these heater pipes being approximately 80 horizontal, B are T's employed for the heater pipe couplings instead of the usual straight couplings and from these T's extend offsets which comprise each an elbow C and a dead-end section E at the end of which the sprinkler head F is secured by an elbow D. These offset portions project from the upper portion of the heater pipes, the 85 dead end section E lies approximately in a horizontal plane so that the offsets as a whole may as occasion requires drain completely into the heater pipes. In order to remove the sprinkler head F from the region directly above the heater pipe A, the offset, 95 or the major portion of it, extends preferably at an angle to the pipe A as will be observed by reference to Fig. 2. The sprinkler head may be secured upstanding or downturned, as indicated in Fig. 1, 100 though the upstanding position is preferred.

An alternative, though to my mind, not a preferable arrangement, is illustrated in Figs. 3 and 4 in which the offsets proceed from the side of the pipe A or union B and 105 the elbow C with the attached dead-end pipe E is canted upward so that the major portion of the offset stands above the level of the water in the pipe A. In this arrangement, as in that shown in Figs. 1 and 2 the 110 sprinkler head F is placed at one side of the heater pipes so as to be out of the direct

current of heated air rising from the heater pipes and also so as to deliver a stream of water the more efficiently in case the sprinkler head releases.

5 In the operation above described sprinkler head offsets work as follows: After the heater system is filled with water and circulation has continued for a time, gas is trapped in the offsets. If the water in circulation through the system did not with a
10 substantial continuity supply this gas for the replenishment of the offsets, the imperceptibly small leakage supplemented, probably by reabsorption of the gases in the offsets by the water in the system would result
15 in filling the offsets with water. Usually, however, the introduction of fresh supplies of water to make up for evaporation, leakage, etc., introduces enough new air to replenish the gaseous content of the offsets
20 and a practically stagnant column of poorly conductive gas saturated with water vapor, which is also a poor heat-conductor, is interposed between the water in the system and the sprinkler head A. Moreover the lateral disposition of the offsets with respect to the pipes A presents an effective area of
25 conductive metal in the offsets to the rising current of air coming from all portions of the apartment so that even if by temporary
30 accidental exhaustion of the occluded gases these offsets were to be filled with water the sprinkler head F will remain at a temperature safely below that at which sprinkler
35 heads are usually set to release, for a time sufficient to allow restoration of trapped gas. Since these sprinkler head offsets are in the preferable construction illustrated in Figs. 1 and 2 arranged to drain completely into
40 the heater pipes, conversely they are so placed as to intercept air-bubbles carried along with the water so that each fresh supply of water to the system will convey to the sprinkler offset a supply of gas to replenish the gases in the offset.
45

The horizontal component of displacement of the sprinkler head from the point of junction of the offset with the circulation pipe measured along the offset pipe greatly
50 exceeds the vertical component. In the preferred form shown in Figs. 1 and 2, the short vertical component is provided by the pipe-member between coupling B and quarter turn C, and the vertically disposed
55 parts of this coupling and quarter turn, while the relatively greater horizontal component is provided by the pipe E. The angle of inclination of the pipe E shown in Fig.

3 affords a similar relative horizontal and vertical displacement.

What I claim and desire to secure by Letters Patent is:

1. The combination in a combined circulatory water heating and sprinkler system of a pipe for the circulation of heating water, upwardly branching offset pipes secured to the circulation pipe and in communication therewith, said offsets terminating in dead ends, the horizontal component of offset of said dead ends from the junction with the circulating pipe measured along the offset being materially greater than the vertical component, and sprinkler heads secured to said offsets at their dead ends.

2. The combination in a combined circulatory water heating and sprinkler system, of a pipe for the circulation of heating water, upwardly and laterally branching offset pipes secured to the circulation pipe and in communication therewith, said offsets terminating in dead ends, the horizontal component of offset of said dead ends from the junction with the circulation pipe, measured along the offset, being materially greater than the vertical component, and sprinkler heads secured to said offsets at their dead ends.

3. The combination in a combined circulatory water heating and sprinkler system, of a pipe for the circulation of heating water, offset pipes secured to the circulation pipe and in communication therewith, each comprising a relatively short vertical pipe member adjacent to the circulation pipe and a relatively long horizontal pipe member extending from the short vertical member, said horizontal members terminating in dead ends, and sprinkler heads secured at said dead ends.

4. The combination in a combined circulatory water heating and sprinkler system, of a pipe for the circulation of heating water, offset pipes secured to and in communication with the circulation pipe, each offset comprising a relatively short member extending upwardly from the circulation pipe, and a relatively long horizontal member terminating in a dead end, and a sprinkler head secured to said horizontal member.

Signed by me at Boston, Massachusetts, this second day of December, 1911.

WILBERFORCE BEECHER HAMMOND.

Witnesses:

OLIN ROBERTS.

CHARLES D. WOODBERRY.