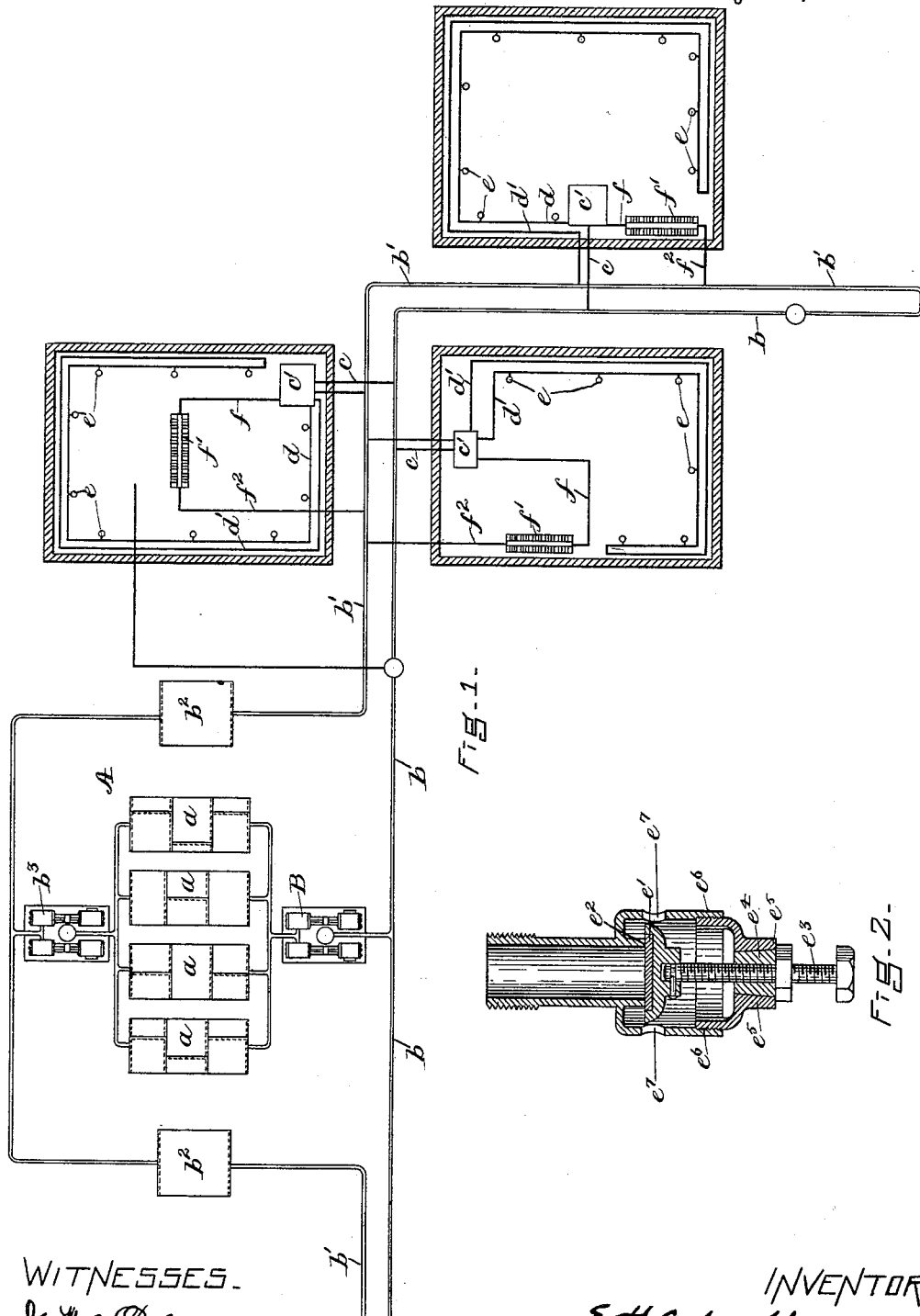


(No Model.)

E. H. ASHCROFT.
STEAM SYSTEM FOR EXTINGUISHING FIRES.

No. 386,621.

Patented July 24, 1888.



WITNESSES.
J. W. Dolan,
A. O. Barnes

INVENTOR.
E. H. Ashcroft,
by his attys
Clarke & Raymond.

UNITED STATES PATENT OFFICE.

EDWARD H. ASHCROFT, OF LYNN, MASSACHUSETTS.

STEAM SYSTEM FOR EXTINGUISHING FIRES.

SPECIFICATION forming part of Letters Patent No. 386,621, dated July 24, 1888.

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To all whom it may concern:

Be it known that I, EDWARD H. ASHCROFT, of Lynn, in the county of Essex and State of Massachusetts, a citizen of the United States, have invented a new and useful Improvement in Steam Systems for Extinguishing Fires, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

The invention relates to a system of distribution of steam for the extinguishment of fires in any locality or building covered by the system of distribution, which involves the superheating of water at a central station, its distribution under pressure through the streets of a given locality by means of a suitable conducting-main, a return-main for maintaining a circulation and returning the exhausted water to be reheated, and converters placed in the buildings of the system, which are connected with the hot-water supply main, and which have extending from them distributing-pipes for the distribution of the steam throughout the building, which pipes are provided with outlets or openings at desired points, closed by valves adapted to be automatically released upon the increase of temperature above a normal point; and I would here say that instead of converting the superheated water into steam in the converter it may circulate from the main directly through the distributing-pipes of the building, in which event a smaller pipe would be used than if connected with the converter.

It is well known that a fire can be extinguished by steam if the fire is practically in an enclosed room or space and a sufficient quantity of steam can be allowed to escape into said room or space; but to be practically successful as a means of extinguishing fire it must be available for use at all times. This cannot be accomplished unless there is a permanent and uniform source of supply—one that is always ready to provide a sufficient quantity of steam when the emergency arises. This cannot be well obtained by the employment of a steam-generator of an ordinary form and adapted to supply steam for power or other ordinary uses. It can only be obtained by making the steam or its equivalent at some

central point or locality, where it can always be maintained in sufficient quantity and under sufficient head to meet all possible requirements. The use of steam-generators at a central point connected with a system of distribution by mains laid in the streets of the locality covered by it might answer if the locality were sufficiently small; but for practical purposes steam generated in this way will not answer; and it is necessary to employ in lieu of steam superheated water—that is, water that is heated in boilers of sufficient strength in which there is no steam, and from which it is caused to circulate through distributing-pipes by means of a pump. This superheated water can be forced through distributing-pipes a considerable distance by pumps without losing its heat to such an extent that it will not, upon being released from the distributing-pipe, be converted into steam, and I use as one part of my system of distribution an apparatus centrally located for thus superheating the water.

A system for providing superheated water from a central source of supply for the extinguishment of fires in the manner above indicated can also be used for the purpose of supplying heat and power, and, on the other hand, systems adapted for making and furnishing superheated water for power and heating purposes can also be utilized by means of distributing apparatus for the extinguishment of fires, hereinafter specified.

Referring to the drawings, Figure 1 is a diagram illustrating the features of my invention. Fig. 2 is a view showing one form of automatic valve for closing a passage or opening in a steam-supply pipe, and which is adapted to be automatically released or opened upon the temperature reaching or exceeding a given degree.

A represents the apparatus for superheating the water, which is centrally located in the locality in which the system is employed, and which comprises a number of boilers, *a*, for superheating the water, connected with a pump, *B*, by which the superheated water is forced through the supply-mains *b*.

b' is the return pipe or main, which preferably is laid alongside the supply-main, and which conducts the water after it has given out its heat, either in the form of steam or

otherwise, to tanks b^3 , from which it is pumped by a pump, b^3 , into the boilers to be again superheated. The supply-main b is connected at different points, by means of distributing-pipes c , with converters c' , placed inside of the buildings to be protected by my system; and from each converter there extends to any or all parts of the building a distributing-pipe, d , which has any desired number of openings or outlets, and which openings or outlets are closed by valves e . The circulation may be maintained in the steam-distributing pipe d by the return-pipe d' , which, when the converter acts also to receive the exhaust and is connected with the return-main b' , may enter it, or which may enter directly the return-main. I have represented in the diagram both forms of organization.

The valves for closing the outlet or opening I have represented as comprising the disk e' , held against a seat, e'' , about the opening or outlet by means of a screw-spindle, e^3 , which passes through a block, e^4 , the block being held in place by the arms e^5 and fusible metal which unites the block to the arms.

The valve-case e^6 has outlets e^7 , through which the steam escapes. The fusible metal employed is one that melts at a comparatively low temperature, and upon melting it permits the valve to be moved or thrown from the opening or outlet by the pressure behind it and the steam to automatically escape through the openings in the valve-case. I would say, however, that I do not confine myself to this special form of valve for automatically controlling the openings or outlets in the steam distributing pipes, as any other form of valve for controlling them adapted to be operated to open them at or above a given temperature may be used.

In Fig. 1 I have also represented the apparatus as used additionally for providing the buildings with heat, the converter being represented as connected by means of the pipe f with the radiator f' , and the radiator being connected with the return-main b' by the exhaust-pipe f^2 .

In use superheated water is caused to continuously circulate through the supply and return mains, and also, either in the form of steam or in the form of superheated water, through the steam supplying pipe d or at any rate to the converter c' , so that there is always a constant and uniform source of steam-supply.

A fire in any room or building covered or protected by the system will cause the auto-

matic opening or release of one or more of the valves, and the room or building is immediately filled with steam from the converter or from the escape of the superheated water through the openings or outlets. As a rule, I prefer to employ a converter, because the superheated water is there converted into steam.

I would say that in lieu of providing the openings of the distributing-pipes with automatic valves there may be a valve placed in the distributing-pipe, between the main and its first opening, adapted to be operated by hand, and placed either upon the inside or outside of the building, but at a convenient point easy of access, so that the supply of steam or superheated water for the entire building may be regulated or provided from one point. I would also say that this valve may be placed in this position in the distributing-pipe in connection with automatic valves for opening the escape outlets or openings thereof.

I would further say that hydrants may be connected with the supply-main, adapted to furnish superheated water or steam to portable pipes or apparatus for conducting the superheated water or steam from the street to the fire, and adapted to be used only for such fire, the superheated water or steam escaping through a nozzle or outlet at the end of the pipe, or in any desired part thereof, the pipe being first placed to bring the opening into close proximity to the fire.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

The improved system for extinguishment of fire by steam, comprising the employment of an apparatus at a central point for superheating water, a suitable main or mains for distributing the superheated water in the locality or section covered by the system, and for maintaining its circulation, a pump or other suitable means for forcing the superheated water through said main or mains, and for returning the exhausted water to the heating apparatus, a distributing pipe or pipes arranged or placed in the buildings protected by the system, connected with the distributing-main, and, if desired, with the return-main, provided with outlets or openings which are controlled by one or more valves, substantially as described.

EDWARD H. ASHCROFT.

In presence of—

F. F. RAYMOND, 2d,
J. M. DOLAN.