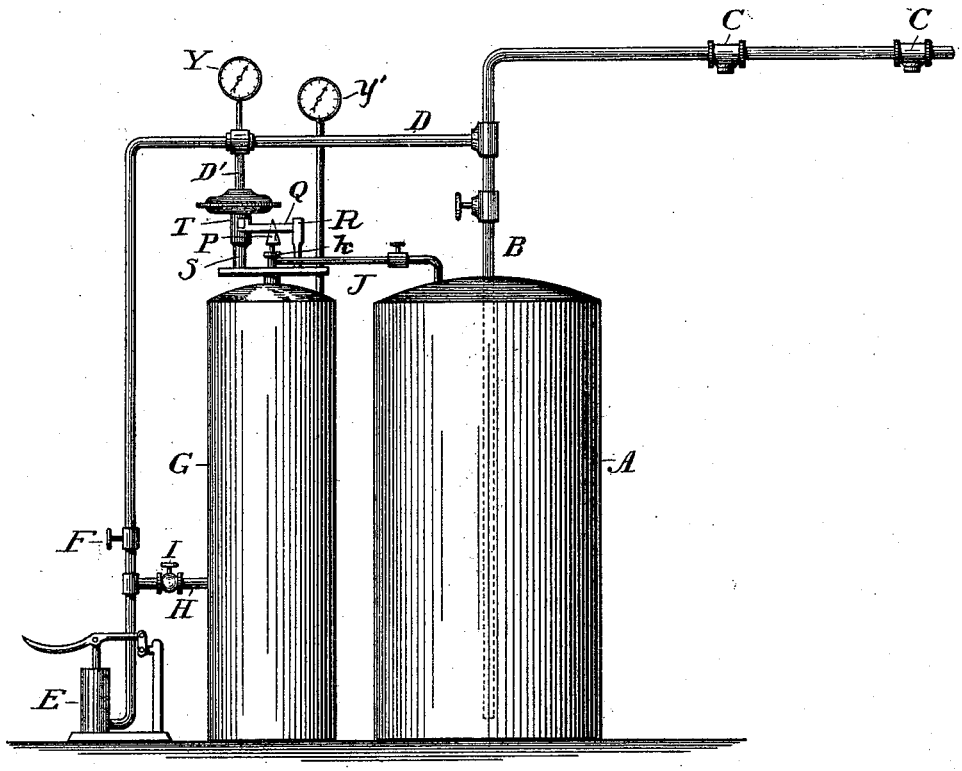
(No Model.) 2 Sheets—Sheet 1.

O. PIERCE.

FIRE EXTINGUISHING SYSTEM.

No. 523,684. Patented July 31, 1894.

Fig. 1.



Witnesses:

Inventor:

(No Model.) 2 Sheets—Sheet 2.

O. PIERCE.

FIRE EXTINGUISHING SYSTEM.

No. 523,684. Patented July 31, 1894.

Fig. 2.

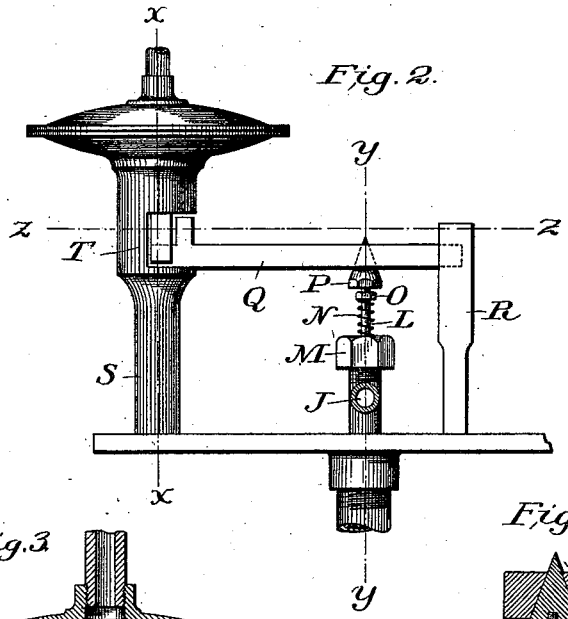


Fig. 3.

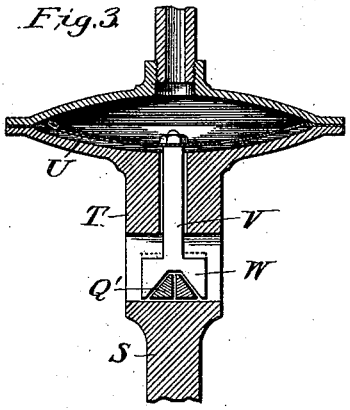


Fig. 4.

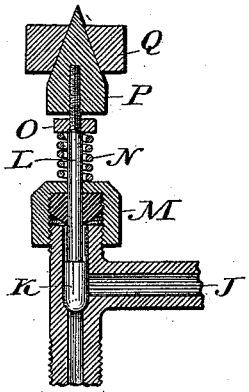
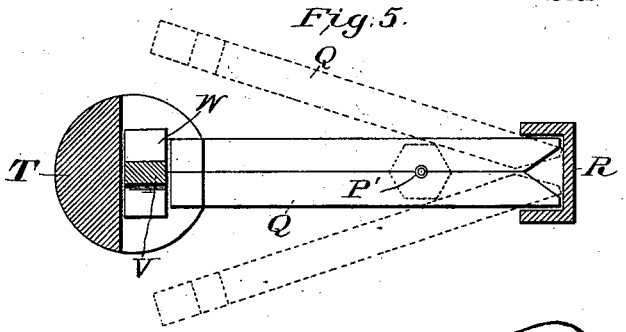


Fig. 5.



Witnesses:

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W. E. Dwight

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Inventor.

UNITED STATES PATENT OFFICE.

OCTAVIUS PIERCE, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE UNDERWRITERS FIRE SPRINKLER COMPANY, OF SAME PLACE.

FIRE-EXTINGUISHING SYSTEM.

SPECIFICATION forming part of Letters Patent No. 523,684, dated July 31, 1894.

Application filed June 12, 1893. Serial No. 477,389. (No model.)

To all whom it may concern:

Be it known that I, OCTAVIUS PIERCE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Automatic Fire-Extinguishing Systems, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates more particularly to that class of automatic fire extinguishing systems, in which the fire extinguishing agent is distributed from a tank under air pressure and my invention consists primarily in the peculiar combination of the distributing system comprising the reservoir, the distributing pipes and automatic sprinklers with a compressed air tank and means for automatically connecting said air tank with the reservoir containing the extinguishing agent under the control of the automatic sprinklers.

Further my invention consists in the specific construction and arrangement of the different parts, all as more fully hereinafter described and set forth in the claim.

In the drawings, Figure 1 is a diagram elevation representing my system as a whole. Fig. 2 is an enlarged detached elevation of the automatic valve controlling the admission of compressed air. Fig. 3 is a vertical section on line *x*—*x* in Fig. 2. Fig. 4 is a vertical section on line *y*—*y* in Fig. 2. Fig. 5 is a horizontal section on line *z*—*z* in Fig. 2.

A is the reservoir which contains the extinguishing agent.

B is the main distributing pipe leading from near the bottom of the reservoir to the different parts of the building to which the system is applied; C are automatic sprinklers in said distributing pipe or branches thereof, said sprinklers being of the well known character, whereby in case of a fire the nozzle of the sprinkler is automatically opened by the heat for the escape of the extinguishing agent.

D is an air supply pipe connecting the distributing pipe with the air pump E. F is a valve in said air supply pipe.

G. is a compressed air reservoir.

H is an air supply pipe connecting the air reservoir with the air pump. I is a valve in said connection.

J is an air supply pipe connecting the reservoir G with the reservoir A. K is a lift valve in said pipe. L is the valve stem thereof. M is a stuffing box through which said valve stem passes.

N. is a coiled spring around the valve stem.

O is a nut for adjusting the tension of the spring and P is a wedge-shaped head secured upon or formed on the valve stem.

Q Q are two horizontal spreader bars.

R is a post provided with a suitable recess in which the spreader bars are pivotally supported at one end, and S is another post provided with a shoulder T on which the opposite ends of the spreader bars are adapted to be supported.

U is a diaphragm inclosed in a casing mounted upon the post S.

V is a stem secured to and depending from the diaphragm in vertical guide bearings formed in the post S.

W is a keeper provided with an inverted V-shaped recess on its under side.

Q′ are the ends of the spreader bars correspondingly formed to jointly engage into the V-shaped groove of the keeper.

P′ are notches formed into the spreader bars to admit a small portion of the head P between the spreader bars.

D′ is a branch pipe connecting the space above the diaphragm with the air pipe D, and *y y′* are pressure gages, one on the air pipe D and the other on the compressed air reservoir.

The parts being constructed and arranged as shown and described they are intended to operate as follows: By closing the valve I and opening the valve F the air is first compressed by means of the pump into the pipe D, and from there into the distributing pipe B until a fixed pressure, say ten to fifteen pounds (as indicated on the pressure gage Y) is obtained. After this fixed pressure in the distributing pipes is obtained, the valve F is closed and the valve I is opened, and the spreader bars Q Q are adjusted in the position, whereby their ends Q′ are confined and held in position by the V-shaped groove in the keeper W, which latter is firmly depressed by the air pressure in the pipe D acting on top of the diaphragm. In this position the valve stem

of the lift valve K is depressed by these spreader bars to close the passage through the pipe J connecting the two reservoirs. Air is now compressed into the air reservoir G by means of the pump until a suitable pressure sufficient in operation to expel the extinguishing agent from the reservoir, is obtained; this pressure being indicated by the pressure gage Y'. The valve I is now also closed and the device is in condition to operate in the following manner:

In case of fire, should any one of the automatic sprinklers G burn out, the compressed air in the pipes B and D escapes and consequently the diaphragm U would lift the keeper W off from the ends Q' of the spreader bars. The latter also have normally a tendency to spread, owing to the upward pressure of the wedge shaped top P of the valve stem under the pressure of air and the tension of the spring L and therefore will immediately fly apart, as shown in dotted lines in Fig. 5. This allows the lift valve K to open and admit the compressed air from the reservoir G in the reservoir A and force the fire extinguishing agent into the distributing pipe to the sprinkler or sprinklers burned out by the fire.

My automatic valve has the advantage of being very simple in construction, none of the parts are liable to stick or get out of order.

The advantages of having a separate tank for air and a separate tank for the fire extinguishing fluid are numerous. One advantage is a reduction in the sizes of the tanks, if two tanks are employed the air tank being only about one third the size of the other and being smaller, the seams can be soldered so as to hold a much greater pressure and if the space (one third) occupied by the air in the tank holding the fire extinguishing fluid is dispensed with, the tank can be reduced that much, making it more convenient to handle.

Having fully described my invention, what I claim is—

In an automatic fire extinguishing system, the combination with the distributing pipes and the supply reservoir containing an extinguishing agent, of a compressed air tank, having a connection into the supply reservoir, a lift valve in said connection arranged to close against the pressure of the air in said tank, an upwardly projecting valve stem, provided with a wedge-shaped head, two spreader bars pivotally supported above the valve stem and adapted to jointly bear upon said head to hold the valve in its closed position, a keeper adapted to engage the free ends of the spreader bars and hold them together, a diaphragm carrying said keeper, an air chamber formed above said diaphragm and communicating with the distributing pipes and means for introducing compressed air into said air chamber and distributing pipes, substantially as described.

OCTAVIUS PIERCE.

Witnesses:
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