(No Model.)

F. GRINNELL.

AUTOMATIC FIRE EXTINGUISHER.

No. 269,199. Patented Dec. 19, 1882.

Fig. 1.

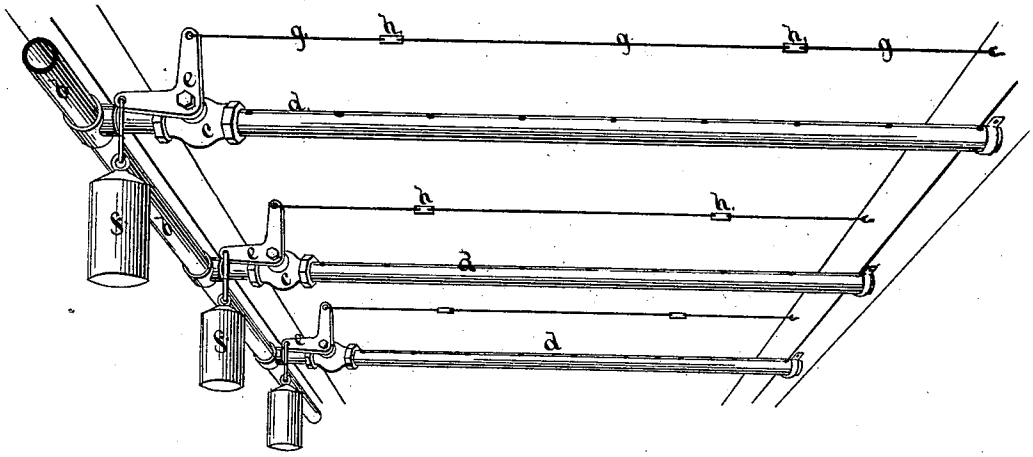


Fig. 2.

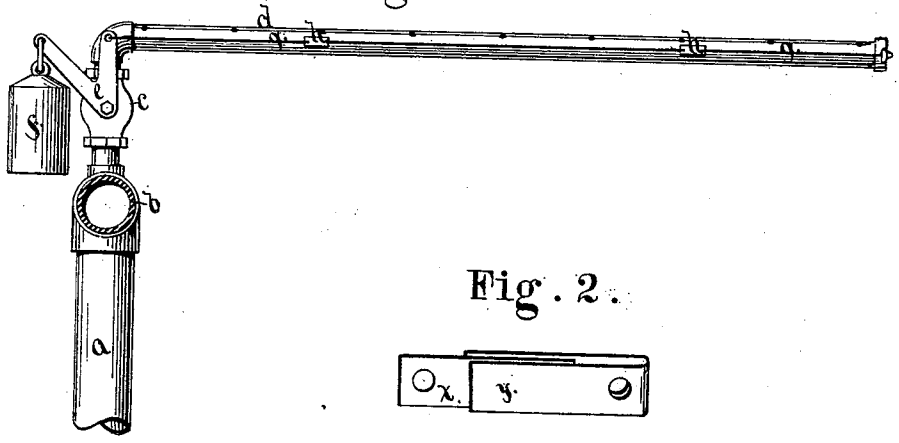


Fig. 2.

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UNITED STATES PATENT OFFICE.

FREDERICK GRINNELL, OF PROVIDENCE, RHODE ISLAND.

AUTOMATIC FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 269,199, dated December 19, 1882.

Application filed May 31, 1880. (No model.)

To all whom it may concern:

Be it known that I, FREDERICK GRINNELL, of the city and county of Providence, and State of Rhode Island, have invented a new and useful Improvement in Automatic Fire-Extinguishers; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification.

This invention has reference to an improvement in fire-extinguishers in which a system of open distributers or pipes perforated with holes are used; and it consists in dividing the whole system into sections and providing each section with any suitable valve, held closed by means of wires or cords, provided with links, held together by fusible solder, which will melt at a temperature indicating a fire, and thus release the valve, as will be more fully set forth hereinafter.

In buildings protected by a system of open sprinklers two main difficulties exist. The first of these is that when the system is subdivided into a number of parts each subdivision must be provided with a valve, to be operated by an attendant when it is desired to admit water to the subdivision from the main supply. The farther this subdivision is carried the greater must be the number of such valves; and no matter how such valves are arranged the great danger is that the wrong valve will be opened by the most experienced and coolest men, as is often the case at experimental tests with such a system when there is no fire. Several large fires have demonstrated that in case of a fire the same difficulty exists. To simplify these arrangements it is usual to subdivide a building only into the respective floors, so that only few valves are used; but here we meet two other and most serious difficulties, the first of which is the damage by water at such parts where no fire exists, and the second difficulty—worse than all the others—is that when the water is let on to such a floor or division the aggregate of all the outlet-openings is so great that the water will barely run out of the numerous holes. There is not the least force to the water, and the quantity is so small that it can have no effect on the fire when divided over the large area. To concentrate this water directly on or near the fire automatically, and only where, by reason of a fire, excessive heat exists, is the object of this invention.

Figure 1 is a perspective view, showing the supply-pipe to a system of perforated sprinkling-pipes connected with the perforated pipes or open sprinkler, a valve placed between the supply-pipe and the perforated pipe, a bell-crank secured to the valve, one end provided with a weight and the other secured by a rod, cord, or wire. Fig. 2 is a side view of the same arrangement with the valve or cock placed above the supply-pipe. Fig. 3 is a view of a sheet-metal connecting-link, held together by means of a solder fusible at a low temperature, the solder being interposed between the two portions forming the link, marked in the drawings *x* and *y*.

In the drawings, *a* represents the rising main, connected with the supply-pipe *b*.

c represents a valve or cock; *d*, a perforated pipe. Instead of the perforated pipe, a number of perforated pipes, or pipes provided with open sprinklers, may be connected with the supply-pipe *b* by the valve *c*, so that a space limited by the water-supply under sufficient force to extinguish a fire with certainty will be controlled by each one of the valves *c c*.

e is a bell-crank connected with the valve-stem. One end is weighted with the weight *f*, so that the valve will be opened by the weight *f*. The other end of the bell-crank *e* is held by a wire, *g*, the other end of which is secured to any fixed object, which may be a wall-beam, or, as shown in Fig. 2, any fixture secured to the pipe *d*. The wires *g g* are united by means of links made of metal united by a solder fusible at a low temperature, so that as soon as the temperature is raised sufficiently above the normal temperature of a room to indicate that a fire has broken out the solder holding the metal parts of the link together will melt and the wire part, releasing its bell-crank lever. The weight *f* will open the valve, and water will enter the subdivision controlled by the valve *c*. The water may now be connected at one place to all the supply-pipes in the building; but it can only escape by the valve or valves so opened, and therefore the whole available water-supply will be concentrated on the fire and the fire almost instantly extinguished. The water may also be left turned

on under pressure, and when a fire breaks out the heat of the fire will release one or more valves and automatically turn on the water, so that no matter at what time the fire breaks out it will itself turn on the water and prevent the spreading of the fire. By such an arrangement the water would be confined to the main and supply pipes, and any accidental leakage through the valves or cocks could be readily carried off by drip-pipes, thus reducing the risk from leakage to the lowest point. Manufacturing or other establishments now provided with open perforated pipes can thus be quickly and cheaply converted into the automatic system, and in all cases the whole available water force can be concentrated on the fire and its vicinity, the fire controlled when it is small, and extensive conflagrations prevented.

It will be seen from the foregoing description that my improved automatic fire-extinguishing system is composed of the following essential elements, to wit: distributers arranged in a series of independent subdivisions, each subdivision consisting of a pipe having one or more longitudinal series of perforations, or a pipe having a longitudinal series of open distributer-nozzles; a supply-pipe common to all of the independent subdivisions of the series; an independent automatic cock or valve placed at the inlet or supply end of each subdivision—that is, at the junction of such subdivision with the common supply; and independent means for each subdivision for holding the valve of such subdivision in its closed position until the temperature within the space occupied by such subdivision is raised beyond a certain limit.

I am aware that it is old to provide a main pipe with branches, each one of which is fitted with an open distributer-nozzle, the supply of water to each distributer being controlled by a separate valve. This arrangement I do not claim, as it differs materially from mine, it being my purpose, as I have hereinbefore stated, to control the supply of water to a number of distributer-nozzles (included in a subdivision) by a single valve.

Having thus described my invention, I claim as new and desire to secure by Letters Patent—

1. In an automatic fire-extinguishing system, the combination, substantially as before set forth, of the distributers arranged in a series of independent subdivisions, the supply-pipe common to all of said subdivisions, the independent automatic valves or cocks, one of which is located at the supply end of each of said subdivisions, and the fusible connections for holding each valve independently in its closed position until the temperature within the space occupied by a subdivision is raised beyond a certain limit.

2. The combination, with the supply-pipes *b* and a series of perforated pipes, *d*, communicating therewith, of the valves *c*, constructed and arranged to govern the flow of water from the pipe *b* to the series of pipes *d*, bell-crank levers *e*, weights *f*, wires *g g*, and links *h h*, the latter being secured to the wires by fusible solder, substantially as set forth.

FREDERICK GRINNELL.

Witnesses:
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