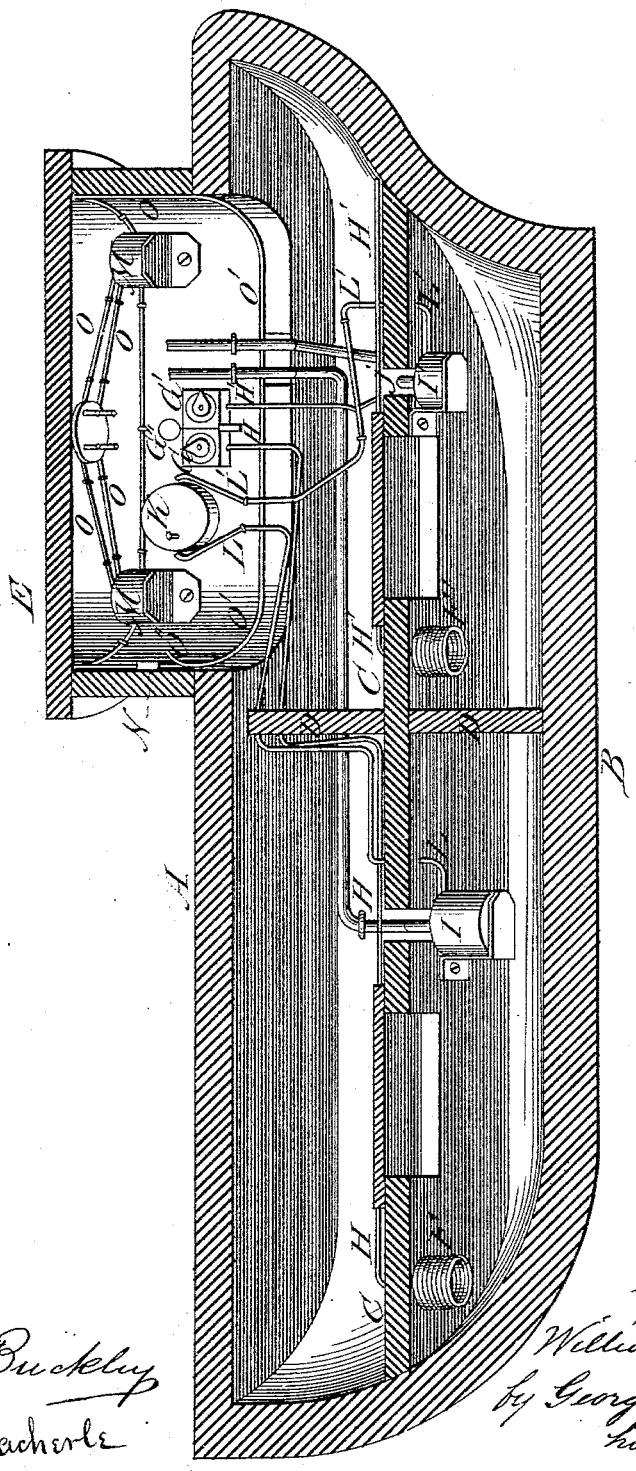
W. H. JOHNSTONE.

System for Detecting and Extinguishing Fires.

No. 210,944. Patented Dec. 17, 1878.



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## IMPROVEMENT IN SYSTEMS FOR DETECTING AND EXTINGUISHING FIRES.

Specification forming part of Letters Patent No. **210,944**, dated December 17, 1878; application filed April 2, 1878.

*To all whom it may concern:*

Be it known that I, WILLIAM H. JOHNSTONE, of the city of Philadelphia, State of Pennsylvania, have invented a certain new and Improved System of Detecting and Extinguishing Fires; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawing, making part hereof.

The nature of my invention will be fully set forth in the following specification and claims; and to enable others skilled in the art to make and use it, I will describe its construction and operation.

The drawing represents a longitudinal vertical sectional view of a ship or vessel, showing an arrangement of my system within.

A is the deck of the vessel; B, the bottom thereof; C, the second deck; D, bulk-head, separating the spaces below decks into different apartments. E is the cabin of the vessel. F F′ are thermostats, situated in the two lower apartments, and connected with the indicators or annunciators G G′, respectively, by means of the wires H H′. I I′ are boxes containing dry compound for extinguishing fires. J J′ are fuse-tubes, to protect the fuses in their course from the boxes I I′ to the cabin, where they terminate beside the annunciators G G′. G″ is a bell, which is sounded by the annunciators G G′. K is a frictional generator of electricity. L L′ are wires to convey the electric spark from the generator K to the boxes of compound I I′. M M are boxes of fire-extinguishing compound, connected by fuse O′. O O are fuses, passing from boxes M M to the disk hung in the middle of the ceiling, and the ends of these fuses hang down through holes in this disk, as shown. Each thermostat F or F′ is connected with a magnetic battery, which charges a wire contiguous to the thermostat, and the end of which wire is only separated therefrom by a narrow space. Now, when the thermostat is operated upon by the heat of a fire, it moves its end against this wire from the battery, thus completing a circuit directly with the annunciator G or G′ through wire H or H′. This, by means well known to the public, strikes the alarm-bell G″, and, by an indicating-figure, points to a letter or number representing the apartment in which the thermostat is located, thus directing the attention of the person called by the annunciator to that apartment.

Now, supposing the alarm to have come from the thermostat F in the forward lower hold of the vessel, the person whose attention is called can immediately light the fuse projecting from the end of tube J, which conducts fire to the box of fire-extinguishing compound in box I in the same apartment as thermostat F; or, to insure the fire or spark reaching this box, or a series of boxes, the end of wire L is set into circuit with generator K, and a few turns are given to the drum K by means of its handle, then a short backward turn, and an electric spark or flash is instantly sent along wire L into box I, starting it burning, and thus evolving the necessary extinguishing gases. If other boxes similar to I are connected therewith by means of fuses, all these boxes will be fired, and the fire will be extinguished in that apartment.

N is a hollow tube, half-way through which is passed the one end of fuse O′ as it comes from the ceiling. The contiguous end O″ can be disconnected therefrom, as shown in the drawings, and at night can be pushed into the tube and be made to impinge against the other end, which is already in the tube, thus completing the fuse-circuit.

The generator K is a frictional apparatus for generating electric sparks or flashes, and is such as is used very commonly now in exploding dynamite and other explosives in mining and blasting, and is operated by turning the drum rapidly in one direction by means of the handle or knob shown in the disk of its end, and then giving a backward turn to it, and the flash can be thus sent along either wire L or L′ by first pushing in the upper end of the wire along which the flash is to be sent until it completes the circuit with the point at which the electricity is generated. There is a small hole to receive it and make the circuit.

The manner of completing a circuit between a battery and a wire by means of a thermostat which is so set that the circuit will be completed at about a desired heat is well known in the arts, and needs no special de-

scription here. I have here shown a thermostatic coil, but any other thermostat can be used.

The dry chemical compounds which I above refer to are those compositions which by ignition will evolve carbonic-acid gas and other gases antagonistic to flames or oxygen. They are so mixed as to be readily ignited by means of a spark, and are also so compounded as not to explode, but to burn comparatively slowly.

I have here described my system as applied to vessels; but, as will be readily seen, it is applicable to buildings of all descriptions, and particularly to hotels.

It will be seen that, while I locate the thermostat F and box I in the lower forward hold of the vessel, they are properly connected by conductors H, J, and L to the cabin in the upper rear portion of the vessel, and an alarm of fire given in the cabin from the thermostat F may be immediately followed by the sending from the cabin of fire to the box I along the conductor J or L, or both, to extinguish the fire in that lower forward hold. Thus no access of persons to the hold is necessary to put out the fire.

The battery used in connection with thermostat F may be placed on deck or in the cabin, or in any convenient locality where it can be looked after from time to time and kept up to requisite strength, and a wire, named above, is to be passed from it to the thermostat or close to it, so that the thermostat, when the degree of heat to which it is set is reached, may touch it and complete the circuit, to sound the alarm or to operate the annunciator.

The wire L or fuse-tube H, or both, if both are used, are so disposed as to be as much as possible out of the way of the cargo—viz., around the interior at the junction of the flooring with the sides of the apartment protected. Instead of employing the fuse-tube H the fuse may be left exposed, and may be so disposed as to be fired by any flame which may occur in the apartment guarded by the compound. In such case the firing of the compound from the cabin will be unnecessary. The wire L, I make of platinum, or of some metal not easily fusible and so strong as not to be easily broken by parts of the cargo knocking against it. The operation of the gases evolved by the chemical compound is to displace, absorb, or neutralize the oxygen of the apartment, rendering the surrounding atmosphere unfit to support combustion, and thereby extinguishing the fire. The chemical compound when fired fuses into a molten lava-like substance, which in dropping would very rapidly burn or damage any combustible substance beneath before it could be put out by the gases evolved; and to avoid this, I, in practice, set the tin can or case containing the compound into a casing formed of an iron cylinder of about quarter-inch thickness, having an open top, or whose top is grated or perforated, and the upper parts of the sides of this cylinder are likewise grated or perforated to permit the free escape of the gases; but the lower part is tight, and will receive and retain the molten lava within it and allow it to cool without doing any damage.

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

1. As a system for detecting and extinguishing fires, a thermostat, F, and an alarm, G″, located in separate apartments, connected by an electric conductor, H, the alarm G″ being operated by electricity from a battery through conductor H and a box of chemical compound, I, located in the same apartment as the thermostat F, and a fire-conductor passing from the vicinity of the alarm G″ to the interior of box I, all operating substantially as described, whereby a fire occurring in one apartment can be detected in another, and can also be extinguished from the former apartment.

2. As a system for detecting and extinguishing fires, a thermostat, F, and an annunciator or indicator, G, located in separate apartments, connected by an electric conductor, H, the annunciator or indicator G being operated by electricity from a battery through conductor H, with a box of chemical compound, I, located in the same apartment as thermostat F, and a fire-conductor passing from the vicinity of the annunciator or indicator G to the interior of box I, all operating substantially as described, for detecting in one apartment a fire which happens in another apartment, and extinguishing the same from the former apartment.

WILLIAM H. JOHNSTONE.

Witnesses:
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