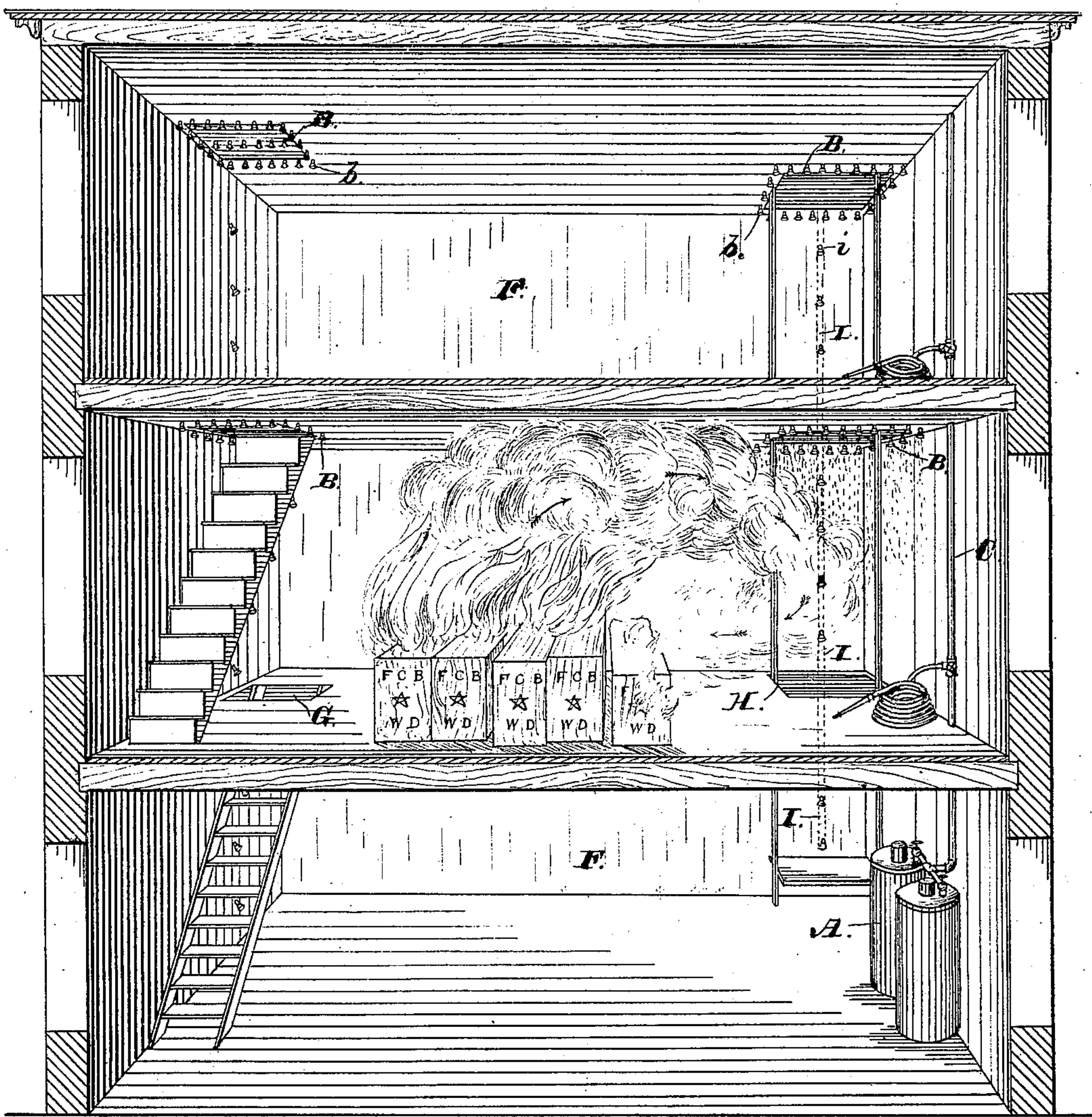


(No Model.)

2 Sheets—Sheet 1

J. M. POLLARD.  
Process of, and Apparatus for, Extinguishing Fires.  
No. 237,901. Patented Feb. 15, 1881.

Fig. 1.



WITNESSES=

Jas. E. Hutchinson.  
J. A. Rutherford

INVENTOR.

Jas. M. Pollard,  
by James L. Norris.  
Att'y.

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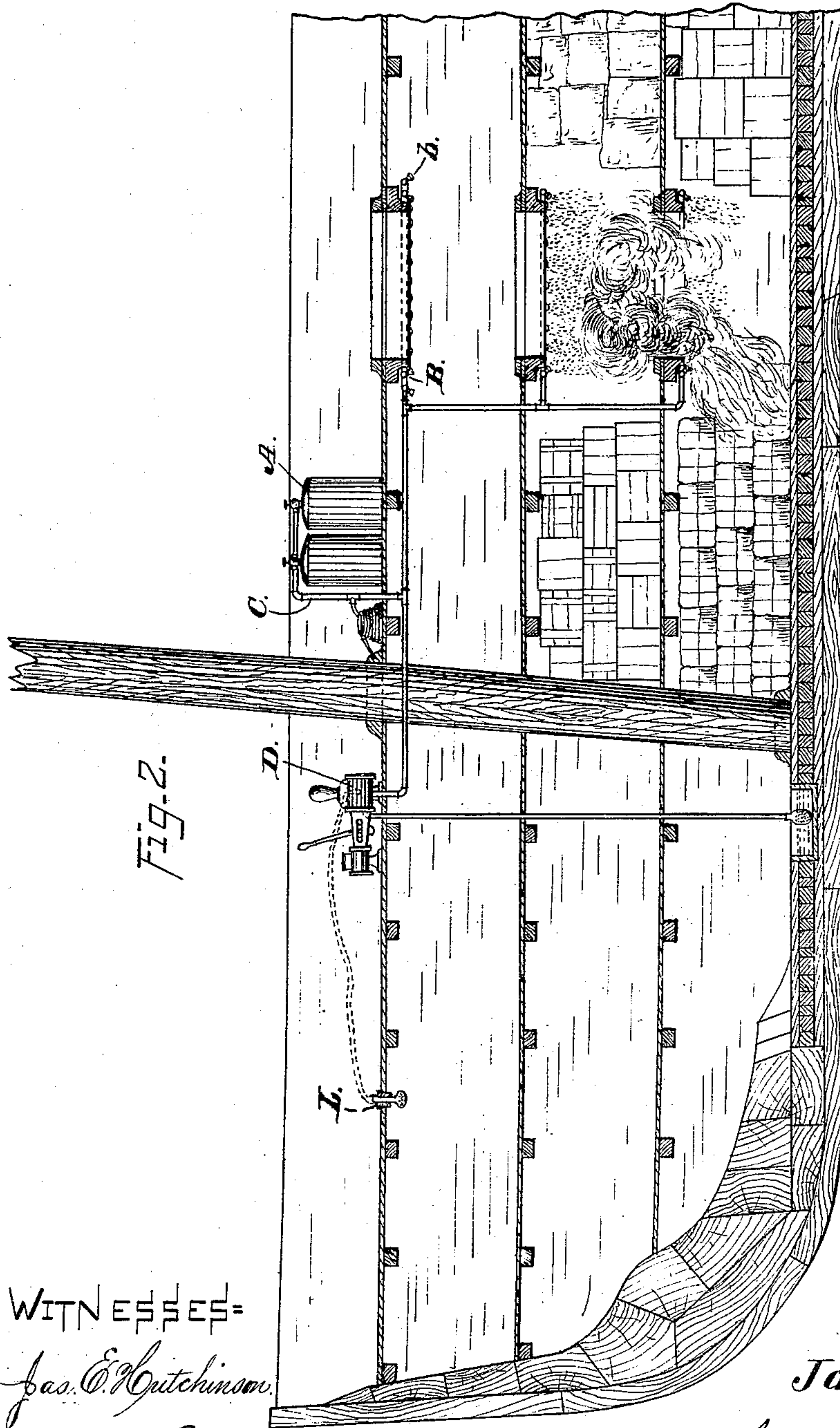


Fig. 2.

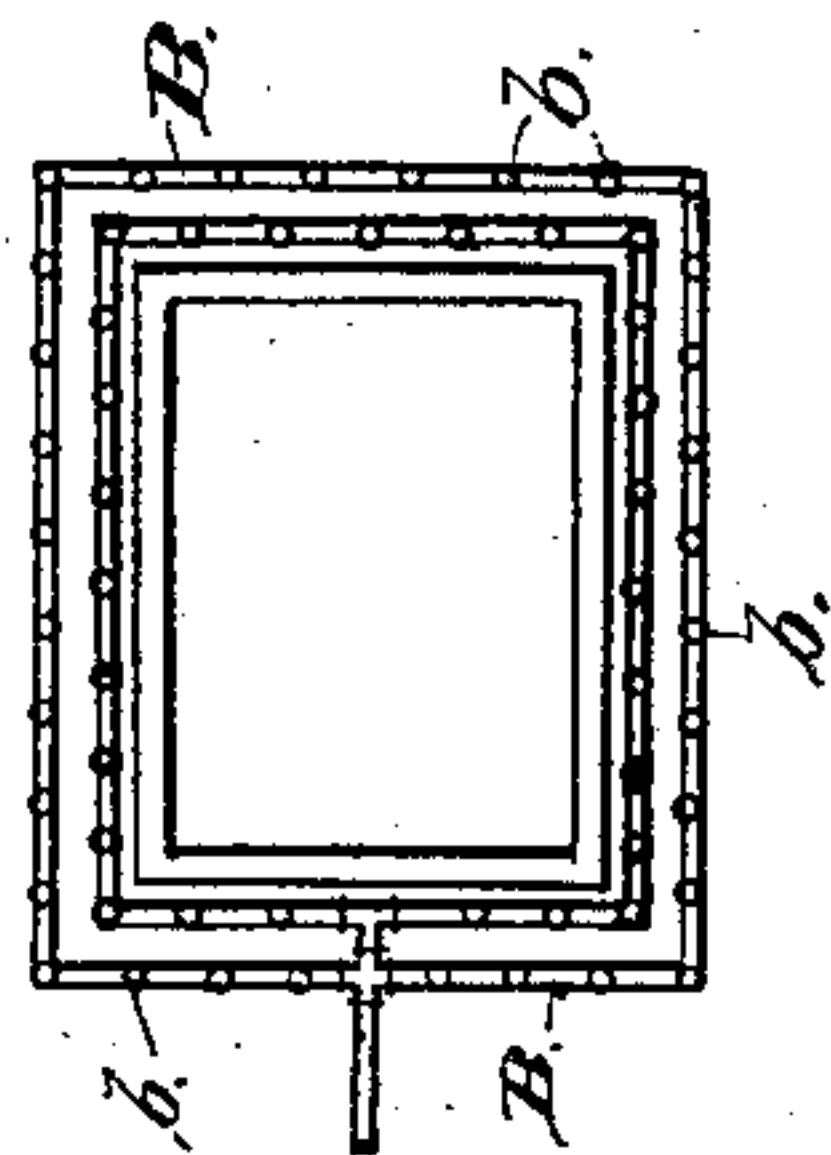


Fig. 3.

WITNESSES=  
Jas. E. Hutchinson

J. A. Rutherford

INVENTOR-  
Jas M Pollard,

by James L. Norris  
Att'y.



# UNITED STATES PATENT OFFICE.

JAMES M. POLLARD, OF NEW ORLEANS, LOUISIANA, ASSIGNOR TO GEORGE H. ROBINSON, IN TRUST FOR THE FIRE EXTINGUISHER MANUFACTURING COMPANY, OF NEW YORK, N. Y.

## PROCESS OF AND APPARATUS FOR EXTINGUISHING FIRES.

SPECIFICATION forming part of Letters Patent No. 237,901, dated February 15, 1881.

Application filed May 5, 1880. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES M. POLLARD, a citizen of the United States, residing at New Orleans, in the parish of Orleans and State of Louisiana, have invented new and useful Improvements in Process of and Apparatus for Controlling and Extinguishing Fires in Buildings, Ships, &c., of which the following is a specification.

10 This invention relates to an improved method of controlling and extinguishing fires, and apparatus for carrying the same into effect.

15 It is a well-known fact that air, when brought into contact with or passed through fire, is deprived of its oxygen, and that a compound mixture of gases and vapors is the result, the said gases and vapors consisting usually of carbonic-acid gas, water in the form of vapor or steam, and the nitrogen which formed a constituent of the atmosphere before reaching the fire. All of these resultant vapors and gases are non-supporters of combustion, and if passed a second time through the fire will extinguish it at once; but as these gases are generated by the process of combustion they are heated and expanded or rarefied to such an extent that they are much lighter than the surrounding air, and instantly rise and are replaced by fresh air, which, in turn, finds its way to the fire.

30 The object of my invention is to cool, condense, and contract these gases so that they will be relatively heavier than the atmosphere, and so sink or descend upon the fire by the action of gravity, or to force them back upon the fire by the combined effect of gravity and of a downwardly-projected liquid, as more fully described hereinafter.

40 My invention is further designed to prevent the spread of fires beyond the limits of the floor or apartment in which they originate by causing the escaping gases to actuate, by their high temperature, an automatic liquid-supply, which, being forcibly projected in the form of a spray or mist into the heated gases, at once extinguishes the sparks, reduces the temperature, and forces them downward, thus checking the draft and confining the fire within a small compass, while by making this action

continuous the gases are made to accumulate in such density as to envelop and extinguish the fire. 50

It has heretofore been the custom to arrange automatic or other sprinkling devices in the ceilings of buildings or apartments in such manner as to reach, by the direct application of water, all portions of the room or structure so protected, the jets or discharge-pipes being located at intervals throughout the entire upper portions of said apartments. 55 60

In carrying out my invention I take advantage of the tendency of the heated gases to seek an elevated outlet, and locate my systems of pipes or discharge-jets in such passages and in such manner as to oppose the ascending or escaping gases with a forcibly-discharged descending fluid, which is driven through small openings set closely together, and reaches all portions of the passage or opening with a minute spray or mist so dense as to extinguish all sparks or flame and to reduce the temperature of the gases while forcibly driving them downward, so that their tendency to rise again is overcome until they are cooled sufficiently to prevent their doing so. 65 70 75

My invention consists, first, in the method of checking, controlling, and extinguishing fires by opposing the ascending or escaping gases of combustion at the draft-openings with a spray or mist of fire-extinguishing fluid, causing the said gases to be condensed at such points, cooled, and returned to the fire to assist in checking, controlling, and extinguishing it, essentially as hereinafter more particularly described; second, in the combination, with a chemical fire-extinguisher and a system of pipes provided with jets arranged around the hatchways of the deck of a vessel, of a pump having its suction in the bilge of the vessel and connected with a system of pipes, whereby a chemical solution or pure water, as may be desired, may be forced through the jets, substantially as hereinafter fully described. 80 85 90

In the drawings, Figure 1 represents a perspective view of the interior of a building, showing my invention applied thereto. Fig. 2 represents a portion of a vessel, in longitudinal section, showing my invention as ar- 95



ranged therein; and Fig. 3 illustrates the lines of pipe and jets surrounding the hatchways.

In order to properly distribute the liquid and force it into the gases through the system of pipes and discharge-jets, a suitable pressure must be created and maintained in the pipes, and this may be accomplished by a chemical fire-extinguisher in which carbonic-acid gas is generated, or by means of a tank located at a sufficient height above the discharge-jets, or by means of a pump or other device by which water or chemical solutions can be forced into the pipes under pressure, as more fully hereinafter specified.

In the drawings, the letter A indicates a stationary chemical engine connected with a system of pipes, B, by means of the stand-pipe C. As indicated in Fig. 2, a pump, D, is combined with the engine and the pipes in such manner that either may be used to create a pressure of water in the pipes. The stand-pipe C may be provided with suitable branch pipes extending outside of the building, to which the hose of a steam fire-engine may be attached, when desired.

The apartments F in Fig. 1 communicate with each other by means of the stairways G and elevator-passages H. Above such stairways and elevator-passages, and around the ceilings of the floors through which they pass, where the heated gases created by fire would naturally pass or collect, the system of pipes B above mentioned are located, the said pipes being provided with jets *b*, forming the condenser, as before described. Each battery or each net-work or system of pipes is independent of all others, being so arranged that the entire group around or over a stairway or other opening may be set in action by the fusing of a single metallic plug or other equivalent device with which they may be supplied.

The pipes I, Fig. 1, provided with jets *i* similar to the jets *b*, constitute the arrangement before mentioned for preserving the continuity of the descending columns of cold gases, which it does by maintaining a low temperature and constant downward impulse throughout its length, so that these gases are neither expanded and rarefied nor diverted from their course.

As applied on shipboard there are necessarily some modifications resulting from the difference in structure between buildings and vessels, the principle, however, being the same in each case.

In applying my invention to vessels I arrange the condensing appliances, consisting of the pipes B and jets *b*, in such portions of the hold as desirable, and in case of fire I make the vessel as nearly air-tight as possible. Liquids being then forced into the pipes the heated gases are contracted and vapors condensed, by which means the condenser becomes the objective point to which the heated products of combustion are continually drawn and cooled until they sink downward to the lower portion of the vessel. This process I

continue during a period varying with the character of the cargo, but in any case as long as there is much heat present in the hold, because, although combustion may have entirely ceased, owing to the air in the hold having been deprived of all its oxygen, the gases in contact with the heated portions of the cargo will continue to expand and rise, thus gradually reducing the temperature of the material that has been on fire, and this movement of the gases should be aided by the action of the condenser until the temperature is reduced below the burning-point. I then use a carbonic-acid generator of limited capacity to fill the hold with pure carbonic-acid gas, by which the last vestiges of fire are extinguished, and as this gas is heavier than air it remains in the hold while the hatches are kept closed, thus insuring the safety of the vessel.

To avoid accumulating a sufficient volume of water to damage the cargo or impede the movements or endanger the safety of the vessel, I locate the suction of the pump in the bilge of the vessel, so that the volume of water in the hold receives no addition, unless desired, in which case water can be taken from the outside of the vessel.

The condenser may be stationary and applied at different portions or compartments of a vessel; or it may be arranged to connect with a flexible hose and be inserted at any point through openings made in the deck of the vessel, as indicated at L.

As my invention becomes more effective when the liquid used is colder than the atmosphere or than the ordinary temperature of water, I find an advantage in the employment of liquids in which the temperature is artificially or automatically lowered, and for this reason prefer to use capacious chemical tanks when practicable, in which water impregnated with carbonic-acid gas or a solution of suitable chemicals is maintained under suitable pressure, because when expanding from pressure into the atmosphere these gases greatly reduce or lower the temperature of the water or solution so impregnated. This reduced temperature greatly assists the action of my condenser, while the weight of the cold carbonic acid tends to create and maintain the descending current of gases, while adding greatly to their extinguishing powers. I may, however, employ a chemical "frigorific mixture," as it is termed, which, being automatically mingled when used, will produce a still greater reduction of temperature; but while these methods may be employed in connection with my invention they are not essential to it, as it can be fully carried out by cold water alone.

It will be seen, further, that my invention, where applied in cities, will greatly add to the efficiency of the ordinary fire-extinguishing apparatus by enabling the water from the engine, when the system of pipes are connected with the base thereof, to be directed to the precise points endangered by the heat, which is impossible under ordinary circumstances, ow-



ing to the inability of the firemen to reach such points on account of the intense heat and the danger attendant upon entering a building in which a fire has gained considerable headway.

5 What I claim is—

1. The method herein described of checking, controlling, and extinguishing fires by opposing the ascending or escaping gases of combustion at the draft-openings with a spray or  
10 mist of fire-extinguishing fluid, causing the gases to be condensed at such points, cooled, and returned to the fire to assist in checking, controlling, and extinguishing it, substantially  
15 as specified.

2. In combination with a chemical fire-ex-

tinguisher and a system of pipes provided with jets arranged around the hatchways of the deck of a vessel, a pump having its suction in the bilge of the vessel and connected with a system of pipes, whereby a chemical  
20 solution or pure water, as may be desired, may be forced through the jets, substantially as and for the purpose specified.

In testimony whereof I have hereunto set my hand in the presence of two subscribing  
25 witnesses:

JAMES M. POLLARD.

Witnesses:

JAMES L. NORRIS,

JAMES A. RUTHERFORD.