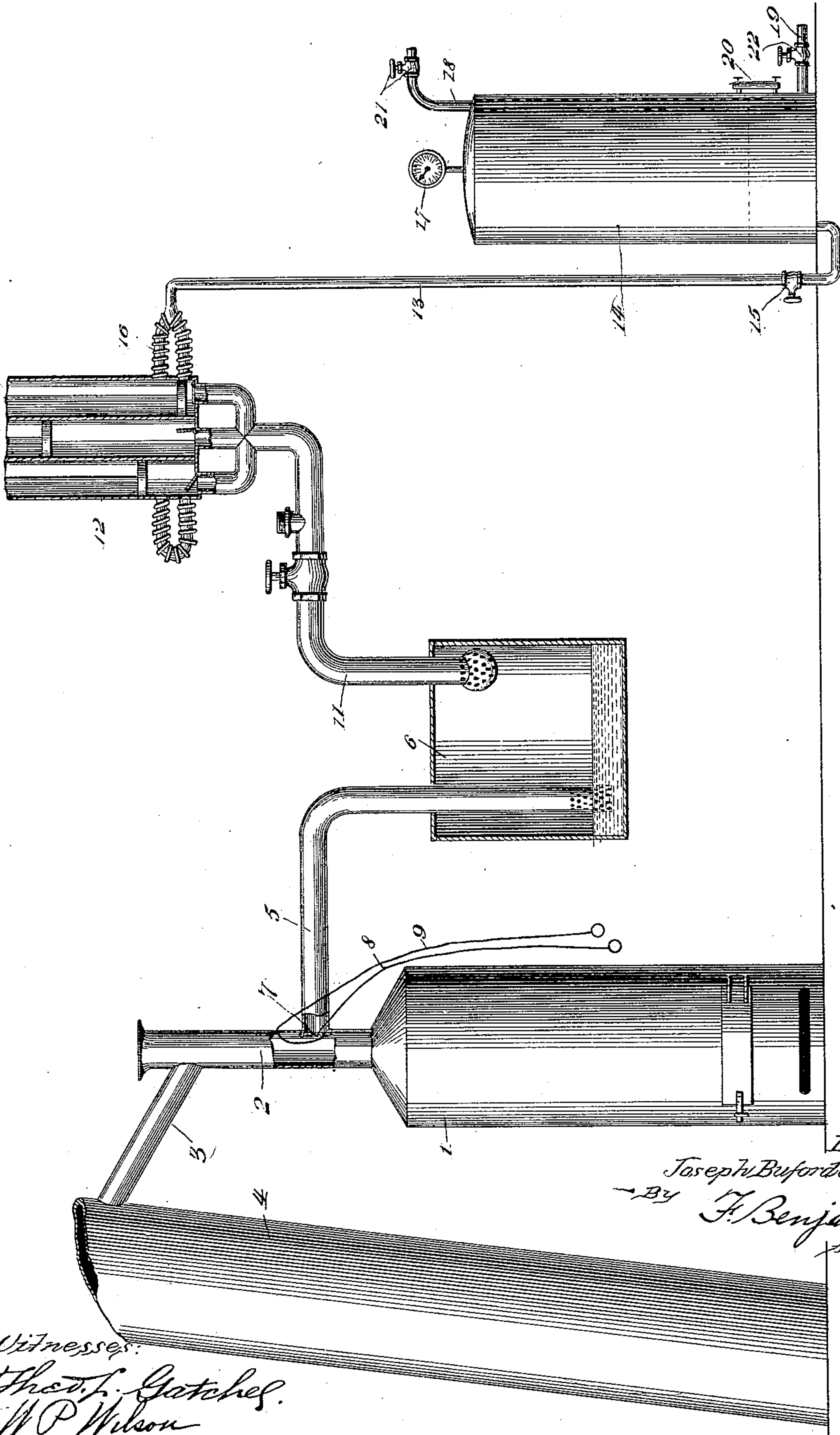


(No Model.)

J. B. GRAHAM.  
FIRE EXTINGUISHER.

No. 547,008.

Patented Oct. 1, 1895.



Inventor:

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By

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Witnesses:

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# UNITED STATES PATENT OFFICE.

JOSEPH BUFORD GRAHAM, OF SAVANNAH, GEORGIA.

## FIRE-EXTINGUISHER.

SPECIFICATION forming part of Letters Patent No. 547,008, dated October 1, 1895.

Application filed July 1, 1895. Serial No. 554,673. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH BUFORD GRAHAM, a citizen of the United States, residing at Savannah, in the county of Chatham and State of Georgia, have invented certain new and useful Improvements in Fire - Extinguishers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to fire-extinguishers, the same being especially applicable to use for extinguishing fire in the holds of vessels. Carbonic acid has long been used for extinguishing flames, but the use of this gas has been found to be quite dangerous by reason of the fact that it is without odor or taste and its presence cannot readily be detected, the inhaling of the same in any large quantities resulting in death to human beings. It is, however, one of the best non-supporters of combustion, and in my apparatus I use this gas in connection with sulphur dioxide, also a non-supporter of combustion, but which has a very pungent odor, which makes its presence easily detected. These gases I generate, on shipboard or other place where it is desired to use them for extinguishing flames, in an ordinary furnace or stove whose stack communicates with the main smoke-stack of the steamer and conduct the said gases through suitable pipes to a spark-arrester partially filled with water, lead the same thence to an air-pump, from which they are forced to a condensing-chamber from which they are discharged to the point where the fire is burning.

My invention consists in the apparatus for generating carbon dioxide and sulphur dioxide and in the mechanism for conveying the same from their source to the point or points at which they are used.

The invention is clearly illustrated in the accompanying drawing, in which is represented diagrammatically my apparatus as applied to a steamship.

1 represents an auxiliary furnace in which charcoal or coke is burned for generating carbonic-acid gas and in which sulphur is placed for generating sulphur dioxide. The stack 2 of this furnace leads, through a suitable pipe

3, to the main smoke-stack 4 of the steamer. Also leading from the stack 2 is a pipe 5, which extends outwardly and downwardly to a closed chamber 6, which is partially filled with water and serves as a spark-arrester or device for clearing the gas from solid matter. A valve 7 is located at the point of connection between the stack 2 and the pipe 5, which is operated by a pair of ropes or rods 8 9, as clearly shown. Ordinarily this valve is opened through the stack 2 and permits the discharge of the gases generated through the main smoke-stack 4. In case of fire, however, the rod 9 is drawn downwardly, which raises the valve 7 and permits the gases to pass through the pipe 5.

The lower end of the pipe 5 is perforated and projects below the surface of the water contained in the chamber 6, the gas thereby being forced through the water and any solid matter or sparks contained therein being removed. From the upper end of the closed chamber 6 leads a pipe 11, which is perforated at its lower end and serves to conduct the gas from the spark-arrester to a compression and suction pump 12. This pump is of the usual form of construction and requires no detailed description. The gases fed thereto are forced through a pipe 13 to the underside of a closed compression-cylinder 14, a suitable valve 15 being provided in said pipe for regulating the admission of the gases, the said pipe being further provided with coils 16, through which water is passed for the purpose of cooling the gases. The compression-cylinder 14 is provided with a pressure-gage 17 and also has leading outwardly therefrom, from a point near the bottom thereof, a pipe 18, which leads to the hold or other part of the vessel where it is desired to apply the fire-extinguishing gases. This cylinder is also provided with a water-inlet pipe 19 at its lower end, by means of which the same may be partially filled with water, if desired. A water-gage 20 is provided on the side of the cylinder 14 for the purpose of indicating the height of the water contained therein.

It should be understood that it is not necessary that any water at all should be admitted to the compression-cylinder 14, as the device will operate by simply passing the dry gases entering through the pipe 13 through the cylinder 14 and out through the pipe 18.



When water is used, however, it will absorb some of the gases stored in the cylinder 14, making sulphurous acid and carbonic acid, which may, perhaps, be applied more readily to the flames than the dry gases alone. A valve 21 is provided in the pipe 18 and a valve 22 in the pipe 19, both for obvious purposes.

The operation of my device is as follows: The carbon dioxide and sulphur dioxide generated in the furnace 1 are conducted by the means described through the pipe 5, spark-arrester 6, and pipe 11 to the compression-pump 12. Through the action of this pump, by any suitable means, the gases are then forced into the compression-cylinder 14 and there condensed and held under high pressure until required for use. When so required, the valve 21 in the pipe 18 is opened, which at once causes a rush of the gases through the pipe 18 to the point where the fire is burning.

Having thus described the invention, what is claimed as new is—

In a fire extinguisher of the class described, the combination with a furnace for generat-

ing carbon dioxide and sulphur dioxide, a spark-arresting chamber partially filled with water, a pipe leading from the stack of said furnace to said spark arresting chamber and projecting beneath the surface of the water contained therein, a valve at the point of connection between said pipe and said stack and means for operating the same, a suction and compression pump and connections between said pump and the upper end of said spark arresting chamber, a compression cylinder adapted to hold water and a pipe leading from said pump to the under side of said cylinder, means for admitting water to said cylinder and a valved distributing pipe leading outwardly from near the bottom of said cylinder, substantially as and for the purpose described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOSEPH BUFORD GRAHAM.

Witnesses:

EDWARD F. DANIELS,  
LUTHER SYKES.