No 649,924. Patented May 22, 1900.

H. B. FEBIGER.

PROCESS OF EXTINGUISHING FIRES IN CLOSED COMPARTMENTS.

(Application filed Dec. 4, 1899.)

(No Model.)

Fig. 1.

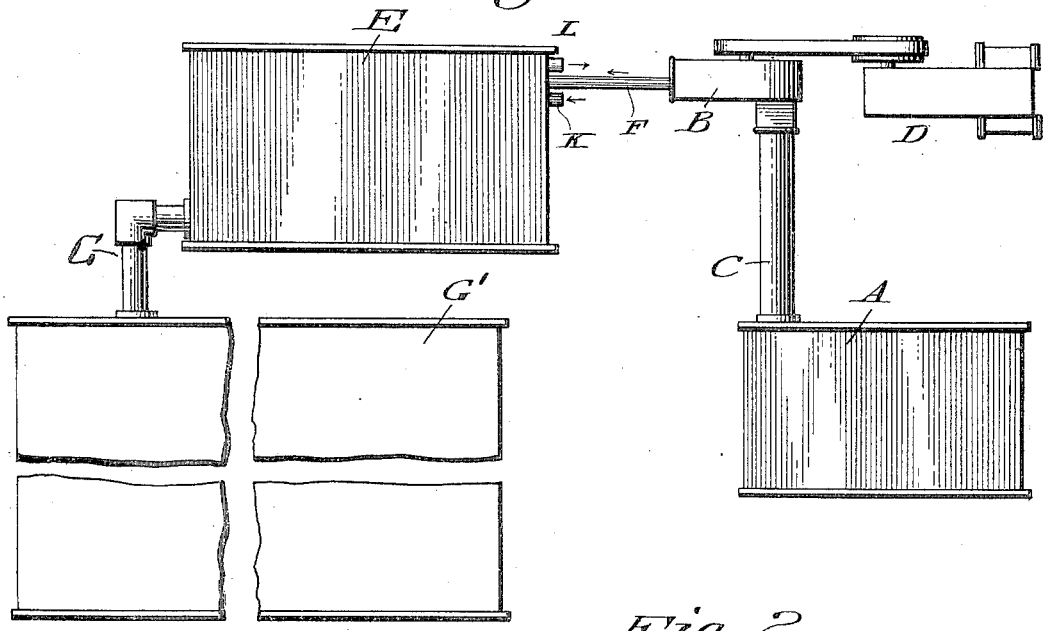
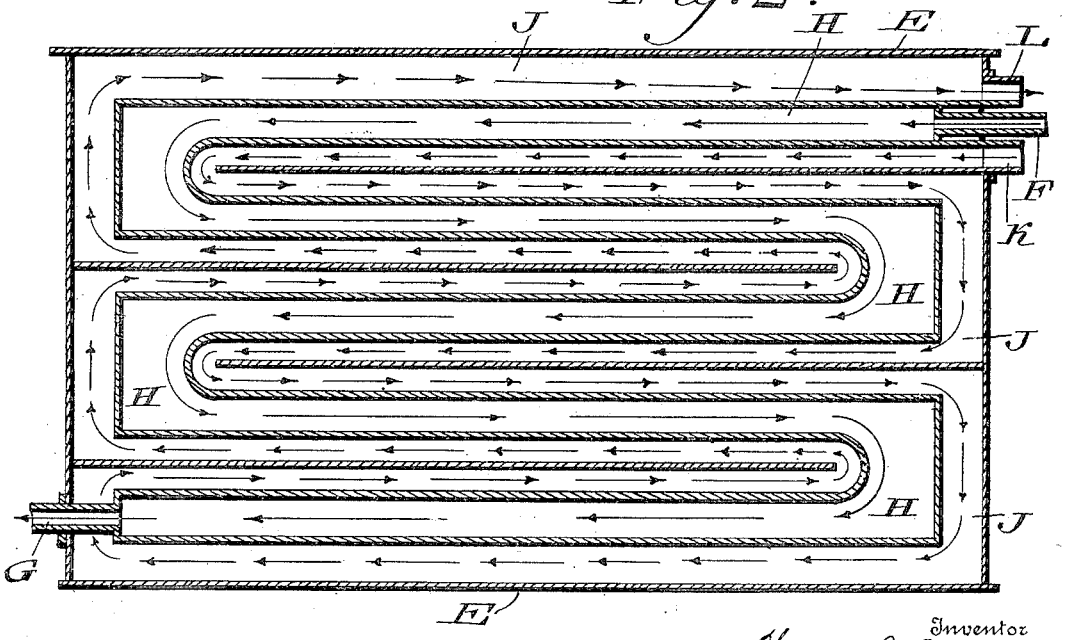


Fig. 2.



Witnesses
P. H. Eagles.
L. Bourdille.

Inventor
Henry B. Febiger.
By Wiedersheim & Fairbanks.
Attorneys

UNITED STATES PATENT OFFICE.

HENRY B. FEBIGER, OF PHILADELPHIA, PENNSYLVANIA.

PROCESS OF EXTINGUISHING FIRES IN CLOSED COMPARTMENTS.

SPECIFICATION forming part of Letters Patent No. 649,924, dated May 22, 1900.

Application filed December 4, 1899. Serial No. 739,211. (No specimens.)

To all whom it may concern:

Be it known that I, HENRY B. FEBIGER, a citizen of the United States, residing in the city and county of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in Processes of Extinguishing Fires in Closed Compartments, which improvement is fully set forth in the following specification and accompanying drawings.

My invention consists of an improvement in a process of extinguishing fires in a closed compartment, which consists in first generating a combustion-non-supporting gas, next subjecting the same to a refrigerating agent, so that its temperature is reduced below the freezing-point of water, and lastly introducing the refrigerated gas into said compartment, so that the fire is extinguished and the temperature of the compartment and its contents reduced, so that charring or igniting by spontaneous combustion is prevented.

In carrying out the process I employ sulfur dioxid as the combustion-non-supporting gas and I refrigerate said gas after it leaves the generator and before it is forced into the compartment in which the fire is located, and in the accompanying drawings I have shown an apparatus in which my novel process can be effected.

Figure 1 represents a plan view of an apparatus in which my process may be effected. Fig. 2 represents a horizontal section of a preferred form of the refrigerating apparatus wherein the step of reducing the temperature of the gas below the freezing-point is effected.

Similar letters of reference indicate corresponding parts in the figures.

Referring to the drawings, A designates a generator, and B a fan or forcing device communicating therewith by a pipe C.

D designates an engine for operating the fan or forcing device B.

E designates the refrigerating apparatus or agent, communicating by a pipe F with the fan or forcing device, while a pipe G leads from said refrigerating apparatus E to convey the refrigerated combustion-non-supporting gas to the closed compartment G', in which the fire is to be extinguished. With the refrigerating device E, I employ the change of state of either ammonia or sulfur dioxid as the refrigerating medium, and, as shown in Fig. 2, said refrigerating device consists of a circuitous passage H, communicating at its ends with the pipes F and G, and the circuitous passage J, having its inlet K and outlet L on opposite sides of the pipe F. The refrigerating medium, as ammonia or sulfur dioxid, expands in said passage J, and from the relative location of the passages H and J it is obvious that the gas passing through the former passage can be reduced to a low degree of temperature—for example, to 28° or 30° above zero or to such other temperature near the freezing-point as it may be necessary or expedient to employ.

I desire to lay especial emphasis upon the step whereby, by the apparatus above described, the combustion-non-supporting gas is refrigerated or reduced to the desired temperature near the freezing-point of water before it is initially admitted into the compartment wherein the fire exists which is to be extinguished, since I have found by practical experiment that the employment of this step of refrigerating the gas results in the attainment of a positive and effective provision for efficiently extinguishing a fire. This step of refrigerating or reducing the temperature of the gas to the desired point near the freezing-point of water becomes in practice a most salient and important feature of my process in order to render my invention commercially and practically effective, it being apparent to those skilled in the art that this step of initial refrigeration differs materially from any other process wherein only a slight theoretical cooling may for a short time take place—as, for example, where the hot combustion-non-supporting gas is conveyed through a closed chamber containing water, in which latter case it will be apparent that the water soon becomes heated to substantially the same temperature as the gas, said water-chamber consequently having in reality more of the function of a boiler than a cooler.

By employing my process it is manifest that the time necessary to reduce the temperature of the material in which fire has been extinguished below the charring-point is very short, and the said charring being prevented at such an early time prevents spoliation of a large quantity of the goods.

It will be readily understood that the charring above referred to is that which takes place even when there is no active flame or combustion in any compartment where a high degree of heat exists, such charring being as equally destructive, however, to the materials as if active combustion took place.

It will be apparent that I do not desire to be limited to the specific degree of cold above named, to which the temperature of the combustion-non-supporting gas may be lowered, as slight variations thereof may occur, according to requirements, without departing from the spirit of my invention.

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

The process of extinguishing fire in a closed compartment which consists in first generating a combustion-non-supporting gas, next reducing the temperature of said gas below the freezing-point of water and then introducing said gas at the temperature named into the said compartment the volume of the non-supporting gas being such that the fire will be extinguished and the temperature of the compartment and its contents reduced below the point necessary for ignition, and spontaneous combustion and charring prevented.

HENRY B. FEBIGER.

Witnesses:
JOHN A. WIEDERSHEIM,
WM. CANER WIEDERSHEIM.