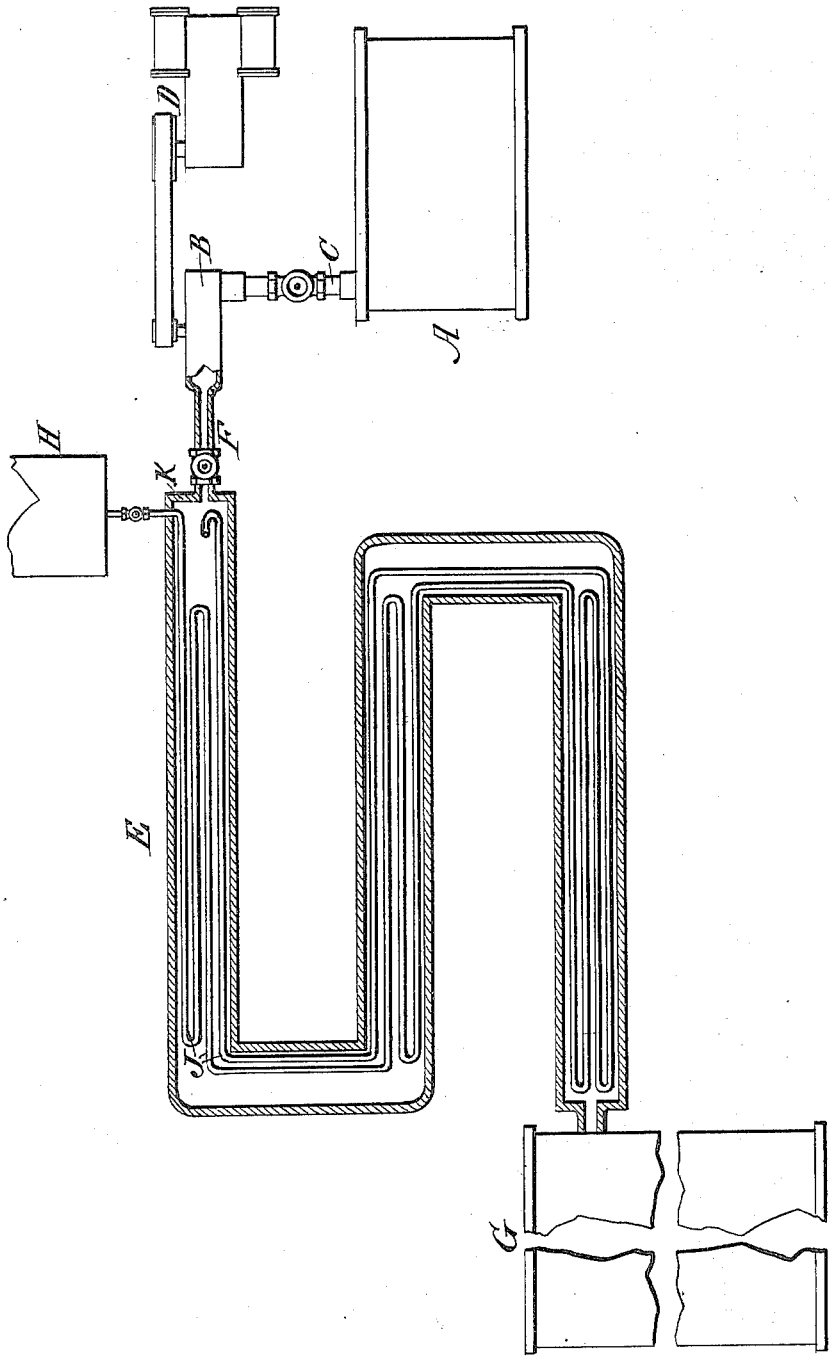
No. 649,923. Patented May 22, 1900.

H. B. FEBIGER.

PROCESS OF EXTINGUISHING FIRES IN CLOSED COMPARTMENTS.

(Application filed Dec. 2, 1899.)

(No Model.)



Witnesses
L. Bonville,
Harry Cobb Kennedy.

Inventor
By Henry B. Febiger.
Widenheim & 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. 649,923, dated May 22, 1900.

Application filed December 2, 1899. Serial No. 738,973. (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 drawing.

My invention consists of an improvement in a process of extinguishing fire in a closed compartment, which consists in employing a combustion-non-supporting gas and in refrigerating the same by the employment of a refrigerating agent, which is also commingled with said gas, the commingled and refrigerated gas and agent being then admitted to the closed compartment, so that the fire is extinguished and the temperature of said compartment and the material therein is reduced.

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

The figure represents a diagrammatic view, partly in section, of an apparatus in which my process is effected.

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

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

E designates a refrigerating apparatus communicating by a valved pipe F with the fan or forcing device, said refrigerating apparatus being suitably connected with a closed compartment G, so that the refrigerated combustion-non-supporting gas can be directed into said compartment. The refrigerating agent employed in practice is preferably sulfur dioxid, the same being contained in the tank H in a highly-compressed state, and the refrigeration is obtained by the change of state due to expansion when the pressure is released. The tank H connects with the pipe J through an expansion-valve, the pipe J being located entirely within the refrigerating device and having a plurality of loops, return-bends, or convolutions which extend throughout substantially every portion of the refrigerating device, said pipe J having its direction reversed at or near the discharge end of the refrigerating device and being extended backwardly through said refrigerating device, so as to discharge the refrigerating agent into the current of sulfur dioxid coming from the generator A at or near the junction of the blower with the refrigerating device, as at K, whereby the refrigerating agent and the combustion-non-supporting gas from the generator are commingled.

The commingled combustion-non-supporting gas and refrigerating agent while passing through the refrigerating apparatus E are subjected to the influence of the refrigerating-pipe J, which of course aids in reducing the temperature of the combustion-non-supporting gas that enters the compartment. Thus the temperature of the gas coming from the generator is not only greatly reduced, but said gas is enriched by the gas coming from the tank H, which may be a one-hundred-per-cent. gas. The combustion-non-supporting gas may thus be brought to a temperature of from 14° to 18° above zero, in which state it is discharged into the closed compartment wherein the fire exists, so that the fire is extinguished, and the temperature of the compartment and of the material therein is so reduced that the temperature is below the heat necessary for ignition and spontaneous combustion and charring is prevented.

I desire to call especial attention to the fact that while five per cent. of sulfur dioxid is a fire-extinguisher, by discharging the refrigerating agent used at the point K in the manner described I make it possible to enrich or strengthen the combustion-non-supporting gas to a strength of sixty per cent., it being impossible without this strengthening of the gas to obtain a greater strength than 20.8 per cent. by the use of the atmosphere in its manufacture.

It will be evident that I have shown the refrigerating device on an enlarged scale with respect to the rest of the apparatus; but I do not care to be limited to the size or shape, as any constructional changes may be made

therein 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—

1. The process of extinguishing fire in a closed compartment, which consists in first, generating a combustion-non-supporting gas, then combining with said gas a refrigerating agent that is employed to reduce the temperature thereof, and lastly, introducing said commingled gas and agent into said closed compartment.

2. The herein-described process of extinguishing fire by means of a combustion-non-supporting gas, which consists in employing a refrigerating agent to reduce the temperature of said gas, in commingling said gas and agent, and in employing the commingled gas and agent in extinguishing the fire.

3. The herein-described process of extinguishing fire which consists in employing a combustion-non-supporting gas, and a refrigerating agent, in commingling the two, and in employing the commingled gas and agent in extinguishing the fire.

4. The herein-described process of extinguishing fire which consists in employing a combustion-non-supporting gas, expanding a combustion-non-supporting gas to refrigerate the same, commingling said gases, and in employing said commingled gases in extinguishing the fire.

5. The herein-described process of extinguishing fire which consists in generating a combustion-non-supporting gas, in refrigerating and enriching the same before employment, and in employing said refrigerated and enriched gas in extinguishing the fire, whereby the same is extinguished and the temperature of the material reduced.

6. The herein-described process of extinguishing fire which consists in generating a combustion-non-supporting gas, refrigerating and enriching said gas by expanding a combustion-non-supporting gas of higher percentage and commingling said gases, and in employing said commingled gases in extinguishing the fire.

HENRY B. FEBIGER.

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