

C. L. GARFIELD.
FIRE EXTINGUISHER.

No. 184,857.

Patented Nov. 28, 1876.

Fig. 1.

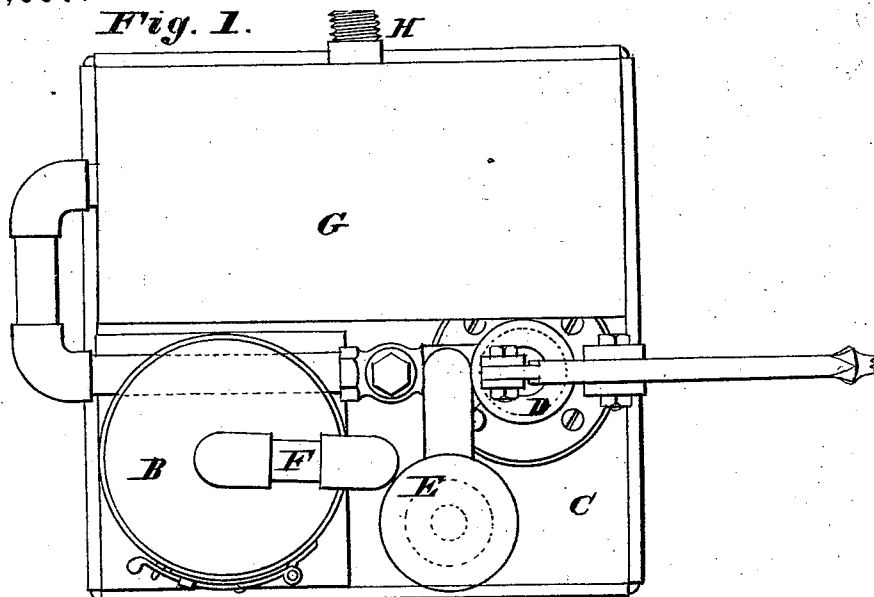
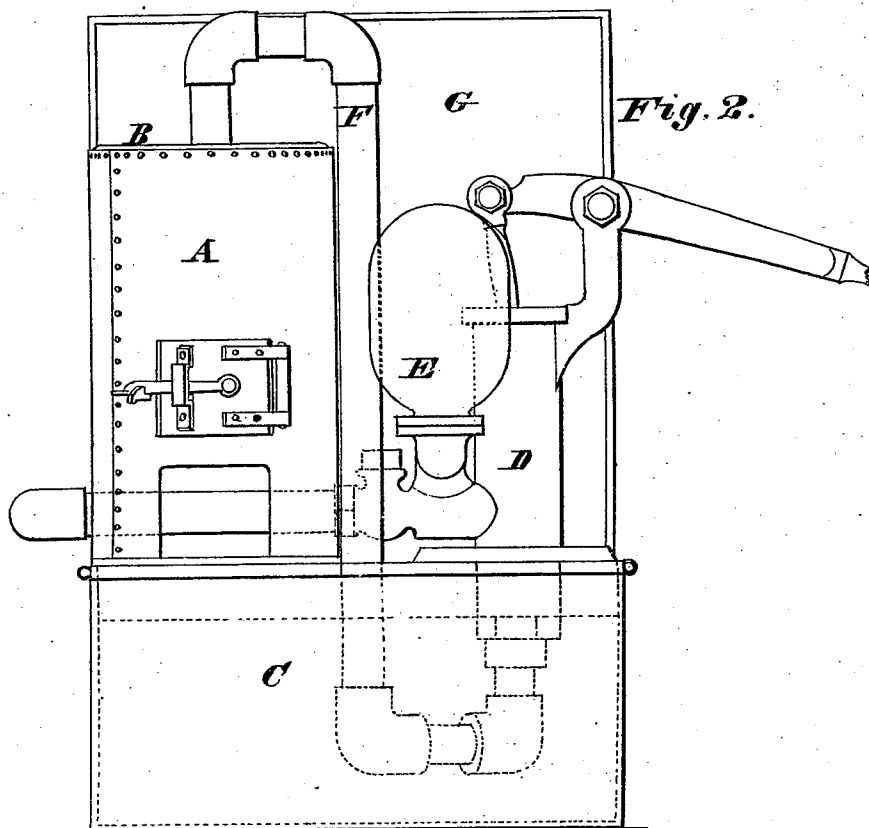


Fig. 2.



WITNESSES

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IMPROVEMENT IN FIRE-EXTINGUISHERS.

Specification forming part of Letters Patent No. **184,857**, dated November 28, 1876; application filed September 19, 1876.

To all whom it may concern:

Be it known that I, CHARLES L. GARFIELD, of Albany, in the county of Albany and State of New York, have invented an Improved Apparatus for Extinguishing Fires, of which the following is a specification:

The want of a rapid, effectual, clean, and indestructive mode or means for extinguishing fire in buildings, stores, storehouses, public buildings, manufactories, vessels at sea or in harbor, and all places where fire can or may occur, with the least damage to the structure, and none whatsoever to the wares contained or deposited in them other than those hurt or damaged by fire, has long been felt. Innumerable instances could be cited to show that greater damage has resulted to furniture in dwellings, wares in stores and storehouses, machinery in factories, and cargoes in vessels by the use of water as a fire-extinguishing agent than from the effects of fire. To check the encroachment of fire and to confine it to the place in which it originated often necessitates flooding adjoining buildings, and when a high wind prevails even this recourse proves unavailing. In winter season the hose for water not unfrequently freezes, and renders all aid, even from the most efficient fire-cocks, futile, and in many instances, also, buildings of great value have been demolished by gunpowder to stop its progress. Instances—Chicago and Boston conflagrations. Even this did not prevent valuable property from being reached and destroyed by fire. Still, while many highly ingenious modes to extinguish fire by gas have been devised to remedy the evil resulting from the use of water as an extinguisher, none seem to compass the desired result. Some of these modes provide for the use of water to mix with carbonic-acid gas and cast it on the fire as a mist. Other methods provide for the generation of carbonic-acid gas or its equivalent, and at the same time provide for the escape of the lighter gas.

The object of my invention is to provide for the above-named want, avoiding entirely the use of water as an extinguisher, to utterly put out and destroy fire without moistening in the least any part of the building or wares contained in it, to confine it to the place of its

origination, and to prevent its spreading in all seasons of the year, independently of the character of the material in a state of candescence. I accomplish this by forcing the nitrogen contained in the atmosphere into the building where the fire rages, at a low temperature, in such volumes as to neutralize the effects of the element upon which alone it subsists and alone can exist—viz., oxygen. This I effect by drawing or forcing atmospheric air, by means of a pump, through a confined candent body, to disengage and disunite the two elements that form and compose it, and using both in the accomplishment of my object. These elements, as is well known, are, by bulk, seventy-nine parts nitrogen; by bulk, twenty-one parts oxygen. I use the oxygen, or twenty-one parts of each one hundred parts of a volume of the atmosphere, to keep up the caloric in my disengaging apparatus or furnace, and the seventy-nine parts of nitrogen thus disengaged, disunited, freed, and separated, without diminution in volume or character, I draw from the disengaging apparatus or furnace by means of a double-acting exhaust and compression pump, through a pipe connecting the disengaging apparatus or furnace to a coil of metallic pipe, or any other form of cooler, immersed in water; or the coil may be surrounded by natural or artificial ice. The pump, being exhaustive and compressive, and provided with proper valves, performs a separate function at each stroke, viz: In its upward stroke it forces the atmospheric air I use through an aperture into and through the confined candent body, to effect a disengagement, disunion, separation, and freedom of the nitrogen, and likewise the volume or seventy-nine parts disengaged by the action of the oxygen is drawn through the coil to cool, and reaches the pump, as before stated, at a low temperature. In its downward stroke it forces this volume through a flexible hose or pipe, provided with a suitable nozzle, directly into the fire, and, if the fire is too intense to be approached, through an aperture provided or extemporized into the compartment containing the fire sought to be extinguished. The effect, by experiment made by me in the presence of several parties, proved almost instantaneous.

Having described the *modus operandi* of disengaging the elements contained in atmospheric air, and the uses they subserve as a means of extinguishing fire, I will now describe a suitable construction of apparatus for use therewith.

In the accompanying drawing, Figure 1 is a top view of the apparatus for treating the air. Fig. 2 is a front view of the same.

The apparatus or furnace A may be square or cylindrical in form, and made of sheet or cast iron. The furnace has a closed top, B, and an air-tight door, B', for the supply of fuel or the renewal of any of the parts, having also all the hereinbefore-mentioned pipe or pipes F connecting with the cooler C. Inside of this furnace I place a cast-iron grate, similar in form to those used in ordinary coal-burning stoves, and upon this grate I place the materials upon which the oxygen is consumed in keeping up the desired caloric for the disengagement and freeing of the nitrogen. When a fire threatens to spread I close all doors and windows in the adjoining building next threatened, and force into it a volume of the nitrogen I free from the atmosphere in such a quantity as to provide for any escape. I thus impregnate an apartment and destroy the power of the oxygen to assist the flames to exist. The capacity of my pumps being known, I know how many strokes are necessary to produce the amount of nitrogen required to fill an apartment or building, and the speed at which they should work. But the nitrogen thus freed from the atmosphere can be stored in tanks or reservoirs for use at a future time, and kept at the ordinary temperature of the surrounding air, and allowed to flow from a main provided for the purpose.

The pump D may connect with an air-chamber, E, which equalizes the flow of air through a suitable hose attached thereto. G may represent a suitable tank in which the air or product may be stored.

Other means may be employed for absorbing or abstracting the oxygen—such as magnetism or electricity, or dia-electro magnetism,

so long as I filter the air and obtain nitrogen as a result of such filtration.

H is an eduction-pipe for the attachment of the hose.

In some cases I may use a compression-pump to force air through the filtering medium.

It will be obvious that it is not necessary to locate the apparatus in close proximity to the fire, so long as sufficient force is given to the extinguishing product through any length of pipe to the scene of the fire.

It is my intention to supply the nitrogen disengaged, as hereinbefore described, on a large scale, so as to supply this air in a similar way as gas or water is furnished to cities or houses, so that instead of using water to put out a fire, I use this air or lighter gas, though it may be desirable to construct buildings in future with suitable means for attachment of the hose.

The air may be drawn or forced through the separating medium and applied directly to the fire without being passed through a cooler.

I do not claim any mode of generating carbonic-acid gas for extinguishing fire; if said gas exists it is accidental. This has been accomplished by a diversity of modes; but

What I do claim as my invention, and desire to secure by Letters Patent, is—

1. An apparatus for extinguishing fires, consisting of a closed chamber for the materials by which the oxygen is separated from the air, a pump or blower by which the air is forced through the said chamber and into contact with the said materials, and a pipe or pipes by which the separated nitrogen gas, with whatever carbonic gases may be intermixed therewith, may be delivered either directly to the fire or to a cooling and storing chamber.

2. The cooling-tank C, in combination with furnace A B, pipe or pipes F, and air-forcing appliance, as and for the purpose set forth.

CHAS. L. GARFIELD.

Witnesses:

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JOHN W. OSBORN.