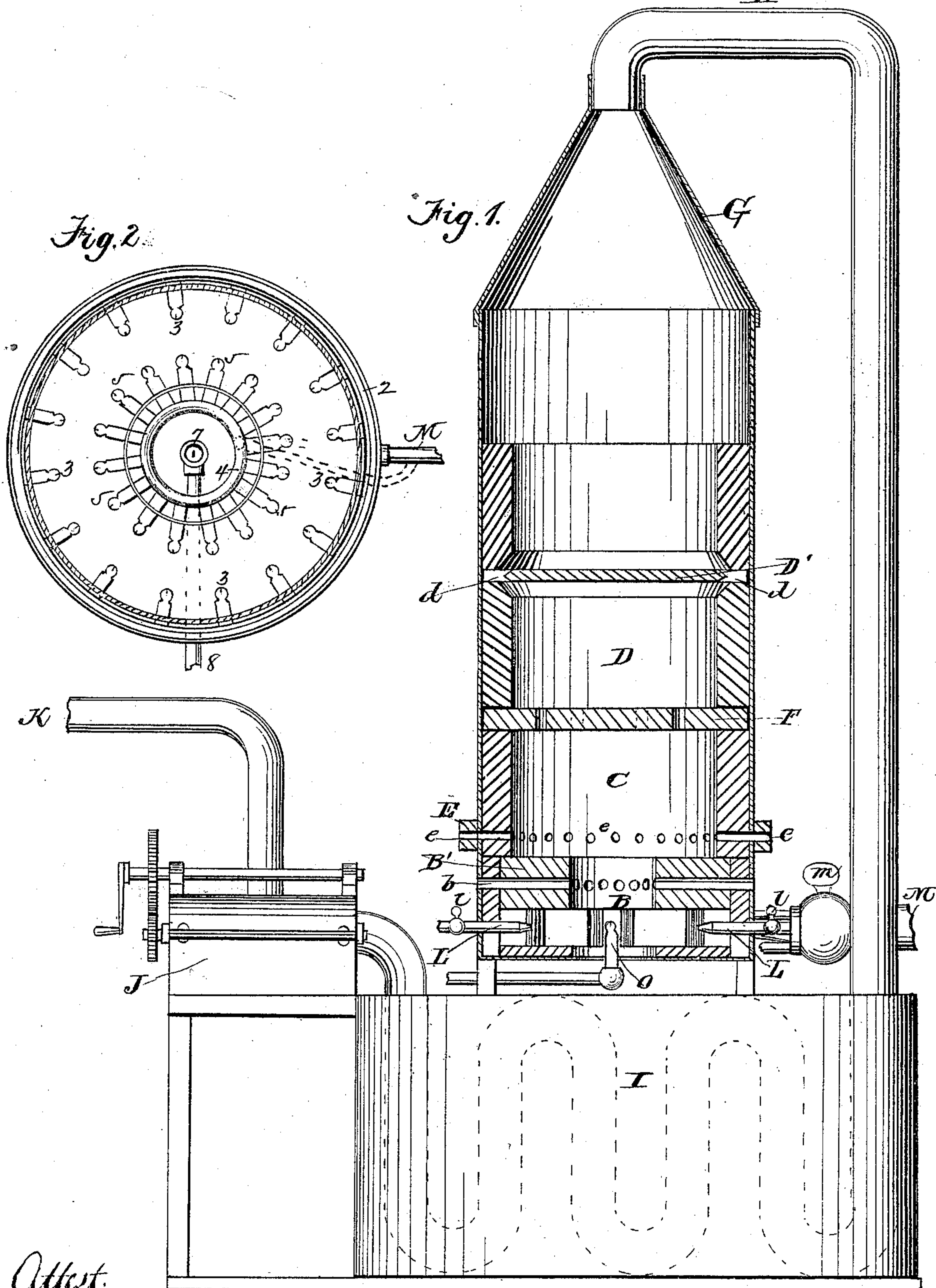


(No Model.)

C. L. GARFIELD.
ART OF EXTINGUISHING FIRES.

No. 283,996.

Patented Aug. 28, 1883.



Attest:
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UNITED STATES PATENT OFFICE.

CHARLES LYMAN GARFIELD, OF ALBANY, NEW YORK.

ART OF EXTINGUISHING FIRES.

SPECIFICATION forming part of Letters Patent No. 283,996, dated August 28, 1883.

Application filed April 30, 1881. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. GARFIELD, of Albany, Albany county, New York, have invented a certain new and useful Improvement in the Art of Extinguishing Fires; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—
Figure 1 represents one form of apparatus employed in carrying out my invention, and Fig. 2 a view of a modification of the gas-supplying arrangement.

This invention relates particularly to the extinguishment of fires by means of gases which are not supporters of combustion, in contradistinction to liquids; and it consists in introducing and burning common illuminating-gas within a furnace supplied with atmospheric air, whereby to effect the deoxygenation of said air, and then drawing off the deoxygenated air or extinguishing element and conveying it where required.

In the drawings I have shown a form of furnace which may be employed in carrying out my invention. It consists of three combustion-chambers, B C D, which may be lined with soapstone, lava, graphite, fire-brick, or other material adapted to resist heat, though preferably with soapstone. The wall B' of the lower chamber, as well as the outer casing of the furnace opposite said wall, is pierced with a series of holes or perforations, *b*, for the admission of external air into said chamber, and a series of perforations, *e*, are made through an external ring, E, which surrounds the lower portion of the second combustion-chamber, and likewise through the casing and lining of said chamber for the admission of external air to that chamber also. A perforated wall or partition, F, is located between the second and third chambers, and the third chamber is provided with a transverse wall or partition, D', which extends nearly to its walls, leaving only a narrow passage, *d*, as shown. The top G of the furnace is preferably cone-shaped, and to it is connected a pipe, H, which passes through a water tank or cooler, I, of any ordinary or suitable construction, no particular form of cooler, nor, in fact, any cooler at all, being es-

sential to the carrying out of my process, and thence to a fan-blower, J, provided with an exit or discharge pipe, K.

L are a number of small tubes leading into the lower combustion-chamber of the furnace and connected to a main pipe, M, through which the supply of gas is obtained. In Fig. 1 one of the small tubes L at the right of the furnace is shown in direct connection with the main pipe M, while the small tube L on the left is shown broken away back of the cock. It will be understood, however, that the last-mentioned tube and all the others of the series are connected to the main pipe M, so as to receive gas therefrom. The small tubes are each preferably provided with a cock, *l*, and the main tube with a cock, *m*, to enable the quantity of gas delivered into the furnace to be regulated and controlled.

In the operation of the apparatus cocks *l m* are opened and the gas rushes into the lower chamber of the furnace through the several radial tubes or nozzles, where it is ignited by means of a flame or jet, O, at the center of the chamber, or by any other suitable arrangement, and burns with intense heat. The gas-jet O may be supplied from the main gas-pipe M, or from any other gas-supply, it being entirely immaterial how the flame is maintained, so long as it is maintained at the point mentioned. The fresh external air rushing in through the perforations *b* becomes decomposed, its oxygen operating to increase the combustion, while its liberated nitrogen passes out with the remaining volatile products of combustion into the second chamber, where, meeting with the atmospheric air entering through the perforations *e*, said air in turn becomes decomposed, its oxygen assisting to increase the combustion, and its nitrogen, uniting with that previously disengaged, passing up in a volume, mixed with a small quantity of carbonic oxide, through the perforated wall or partition F into the third chamber, D, from whence it is drawn by the blower J into pipe H, through cooler I and blower J, and forced out through the exit-pipe K to the fire to be extinguished, or to suitable storing-tanks for future use. Should the pressure on the gas in the mains be not sufficient to supply

the desired quantity to the furnace, a fan-blower or other contrivance may be employed to increase the pressure. In a former application for Letters Patent filed by me on the 5 7th day of January, 1881, I have described a plan of deoxygenating the air in the furnace by the use of hydrocarbon or other like liquid fuel, and have shown an apparatus something like that shown in the accompanying drawings for carrying out that plan. Such plan and apparatus I do not claim herein.

By a series of experiments and practical demonstrations with illuminating-gas I have found that it answers admirably the purposes of a deoxygenating agent, and can be employed with less risk than hydrocarbon.

The deoxygenating apparatus employed may be constructed in the form shown in the drawings, or may be of any other construction that 20 will answer the purpose. It may be located at any suitable point in the building designed to be protected, connection being made with the city gas-pipes by ordinary means. When fire is discovered, the gas is turned on and the suction-fan put into operation, thus putting 25 the apparatus in condition for instant use. The flame or jet which fires the gas in the combustion-chamber is preferably kept constantly lighted, in order to be always ready when required. I also intend to render the apparatus 30 portable, so that it may be transported from place to place like an ordinary fire-engine, and

to provide it with suitable connections, whereby it may be connected to the gas-supply of the city at or near the scene of the fire. 35

To increase the capacity of the apparatus a double series of small gas tubes or jets projecting from concentric tubular rings supplied with gas may be employed, as shown in Fig. 2, M in said figure indicating the main gas-supply pipe; 2, an outer annular pipe fed 40 from said pipe M, and having the series of radial tips or nozzles 3; 4, an inner annular pipe provided with tips 5, and supplied also from pipe M by a pipe, 6, (shown in dotted lines,) 45 and 7 the central firing-tip, supplied from any convenient gas-supply through pipe 8, and, if desired, such double series may be arranged in tiers, one above the other, as will be readily understood. 50

I claim as my invention—

In the art of deoxygenating air for fire-extinguishing purposes, the herein-described mode of effecting the deoxygenation of the air, consisting, essentially, in burning illuminat- 55 ing-gas within a furnace which is supplied with atmospheric air, and drawing off the deoxygenated air or extinguishing element and conveying the same where required, all substantially as set forth.

CHARLES LYMAN GARFIELD.

Witnesses:

HENRY WHITING GARFIELD,
RUSSELL C. CASE.