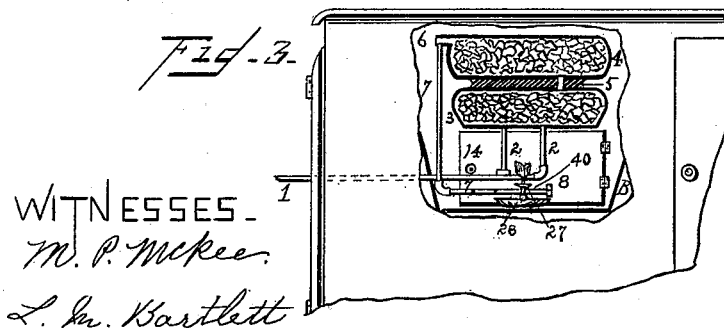
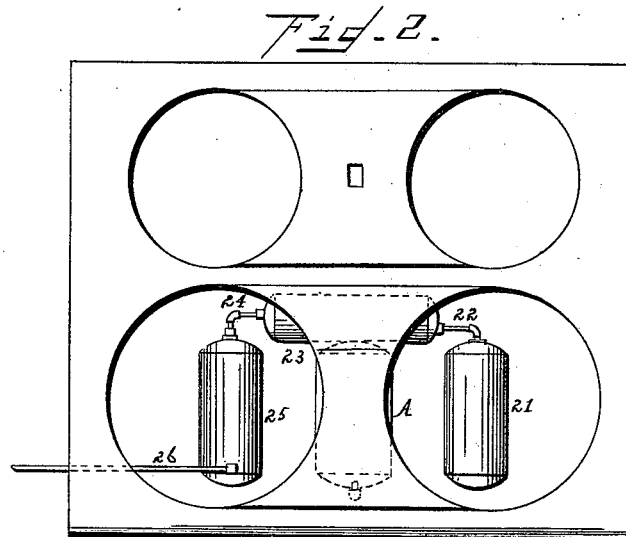
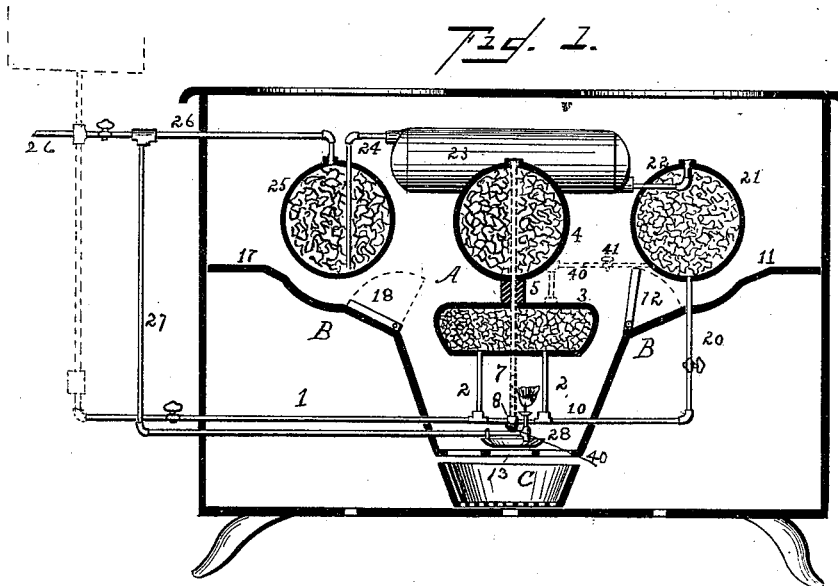


(No Model.)

B. B. CHRISTIE.  
PETROLEUM VAPOR GENERATOR AND BURNER.

No. 421,551.

Patented Feb. 18, 1890.



WITNESSES.

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# UNITED STATES PATENT OFFICE.

BENJAMIN B. CHRISTIE, OF DAYTON, OHIO.

## PETROLEUM-VAPOR GENERATOR AND BURNER.

SPECIFICATION forming part of Letters Patent No. 421,551, dated February 18, 1890.

Application filed January 24, 1889. Serial No. 297,333. (No model.)

*To all whom it may concern:*

Be it known that I, BENJAMIN B. CHRISTIE, residing at Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Petroleum-Vapor Generators and Burners, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to burners for petroleum or other hydrocarbon vapors, and is especially intended for use in stoves, although some features may be used in furnaces for steam-boilers, and for lighting, &c., without departing from the spirit of my invention.

15 The object of the invention is to produce a vapor-burner which shall be continuous and reliable in its operation, and which will generate gas for heating and lighting at the same time.

20 Figure 1 is a front elevation with parts in section showing the arrangement of the retorts, superheaters, and burners in a stove, and the fire-plate and dampers. Fig. 2 is a plan of stove, showing general arrangement of retorts and pipes. Fig. 3 is a broken side elevation of stove, showing central retort in section, and the burner and pipes near fire-plate, parts being omitted.

25 The numeral 1 indicates the supply-pipe through which petroleum is brought to the retorts from a reservoir above the level of said retorts, this pipe being provided with a check-valve, as usual in vaporizers of this character.

30 The pipe 1 has one or more branches 2 leading to the lower chamber 3 of a double retort A. This retort A is a double shell consisting of lower broad or flattened chamber 3 and upper cylindrical chamber 4, preferably cast as a single piece and connected by a rib or web 5, through which there will be at least one perforation. Both chambers of the retort A are filled with jagged or broken pieces of iron or slag, making a sort of metallic filter. The upper chamber 4 of retort A has an offset 6 at its front end, from which a pipe 7 leads down and connects with perforated pipe 8, which pipe 8 forms a burner under the retort. A liquid hydrocarbon entering the chamber 3 will be heated by a fire temporarily built under said chamber, (as in pan C,) and gas will be developed. The gas

will rise, becoming heated by contact with the surface of the broken metal, and will pass into the upper chamber 4 through the perforation in rib 5. In chamber 4 the gas will be superheated and pass out through pipe 7 to the burner 8, where it will be burned to effect the continuous vaporization of the petroleum entering by pipe 1. The burner 8 and lower chamber 3 of retort A are inclosed in a pot 10 in the fire-plate B. This plate B extends across the stove and has inclined surfaces 11 17 at the sides of the fire-pot or combustion-chamber 10. At each side of the pot 10 are hinged dampers or deflecting-plates 12 and 18. These dampers may be turned in toward the retort A, to concentrate the flames about that retort, or they may be turned back to permit the flames to spread to the sides of the stove or furnace. The plate B has an air-passage 13 at the bottom of the fire-chamber for the admission of air, and a small door 14 at one side of the fire-pot to give access to the burner. A branch pipe 20 from pipe 1 conveys oil to the bottom of a retort 21 at one side of the retort A and above the surface of plate B. A pipe 40, controlled by cock 41, may lead a supply of oil from chamber 3 to retort 21. All pipes entering the retorts and superheaters have jagged or saw-teeth ends to prevent stoppage or clogging. The top of retort 21 connects, by means of pipe 22, with the bottom of superheater 23, which superheater extends behind the retort A, and preferably at a little higher elevation than upper chamber 4. Pipes 22 and 26 are embedded in fire-clay to protect them from the flames and heat. A pipe 24 leads from the upper part of superheater 23 to the bottom of a second superheater 25 at the opposite side of retort A from the retort 21. From superheater 25 a pipe 26 leads to a gas-holder or gasometer, or to a furnace or other place of combustion. A branch pipe 27 leads from pipe 26 to the lower part of fire-pot 10, to convey the drip to a burner 40, where it may be ignited or overflow from the burner into a cup 28, where the drip is burned. The dampers 12 and 18 can be turned so that the heat from the combustion-chamber will be concentrated on the retort A, or permitted to pass round either or both the chambers 21 and 25. The retort 21 and superheaters 23 and 25 are filled through

suitable openings with broken metal or slag, as described for retort A. The openings are closed by screw-threaded metal plugs, or in any other suitable manner. The retort A  
5 may be used to the exclusion of the retort 21, or both may be used in conjunction, the connections described enabling the two retorts to co-operate with each other, and the dampers directing the heat from the combustion-  
10 chamber to either or both the retorts, as may be desirable. It will of course be understood that suitable mechanism well known in the art may be used for mixing air with the gases before combustion.

15 What I claim is—

1. The combination of a combustion-chamber, a double retort nearly inclosed in the same, and a single retort at one side of said retort, separate supply-pipes leading to said  
20 retorts, and a hinged deflecting-plate between the retorts, whereby the heat may be concentrated on the double retort or permitted to reach both retorts, substantially as described.

2. In a vapor-generator, a retort A, having  
25 a supply-pipe, and provided with a burner-pipe, a side retort 21, a superheater in rear of retort A, connected to said side retort, a superheater 25 at the other side of retort A, connected to said first-mentioned superheater,

and a pipe leading from the superheater 25  
30 to a place of storage or combustion, said pipe having a branch which conveys the drip to a place of combustion under retort A, all combined substantially as described.

3. In a vapor-burner, the combination, with  
35 a retort, and a connected retort and superheater at opposite sides thereof, of a fire-plate having a depressed fire-chamber under the central retort, and a hinged deflecting-  
40 plate at each side of the fire-chamber, whereby the heat may be concentrated on the central retort or deflected to one or both sides, as set forth.

4. In a vapor-burner, the combination of  
45 the retort having a pipe leading directly to a burner beneath the same, a secondary system of retorts and superheaters nearly surrounding the first retort, and deflecting-  
50 plates by which the heat can be directed to one or both systems, all in combination, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

BENJAMIN B. CHRISTIE.

Witnesses:

W. H. WHITTLESEY,  
CHAS. T. HEEMAN.