(No Model.)

B. G. DEVOE.

REVERSIBLE HYDROCARBON GENERATOR AND BURNER.

No. 546,310. Patented Sept. 17, 1895.

Fig. 1.

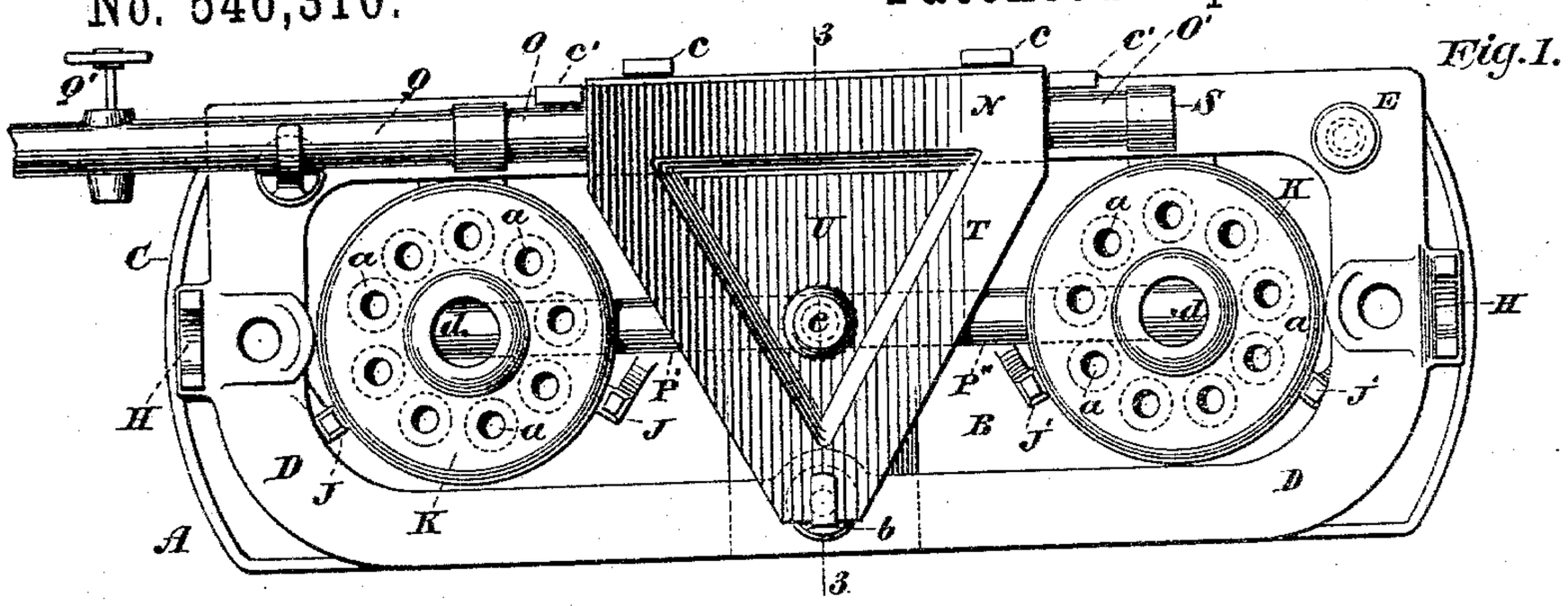


Fig. 2.

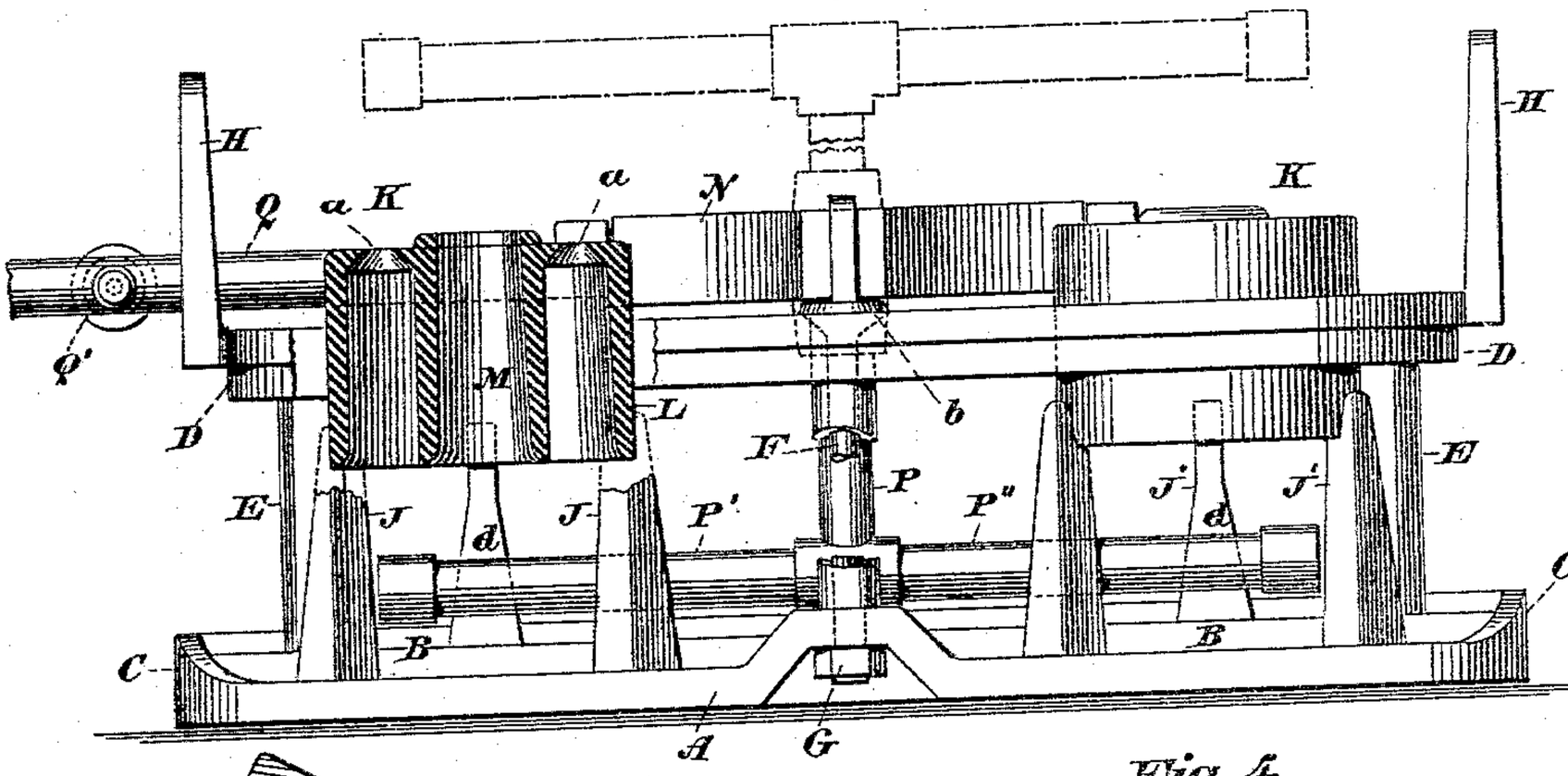


Fig. 3.

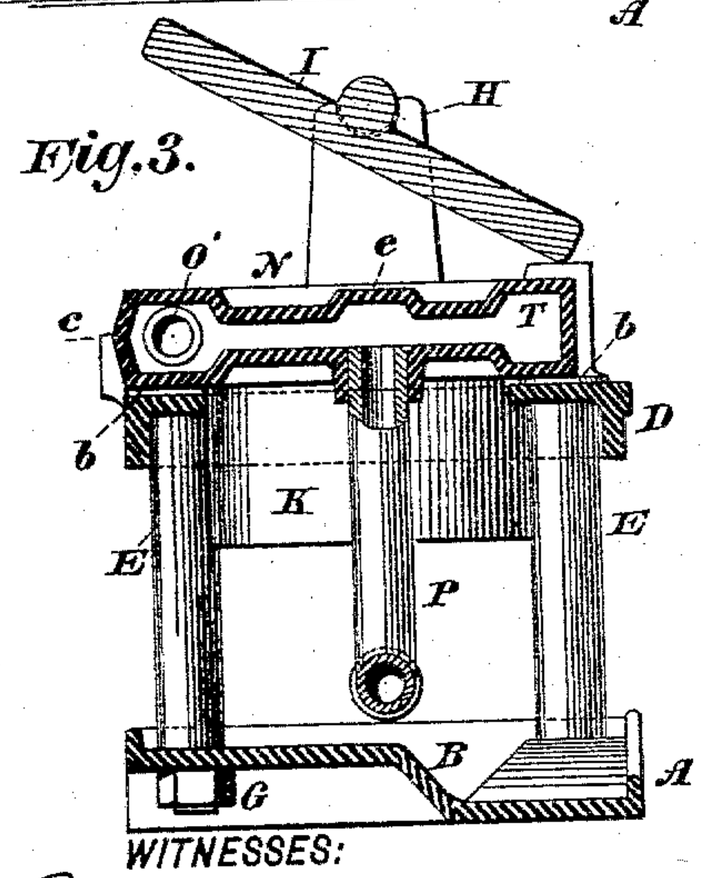
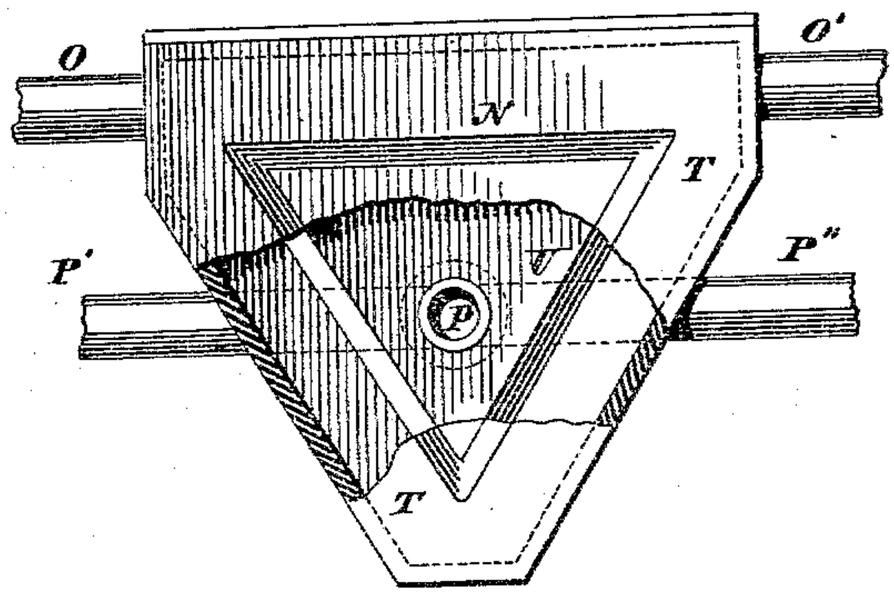


Fig. 4.



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UNITED STATES PATENT OFFICE.

BENJAMIN G. DEVOE, OF LIMA, OHIO.

REVERSIBLE HYDROCARBON GENERATOR AND BURNER.

SPECIFICATION forming part of Letters Patent No. 546,310, dated September 17, 1895.

Application filed March 1, 1895. Serial No. 540,218. (No model.)

To all whom it may concern:

Be it known that I, BENJAMIN G. DEVOE, a citizen of the United States, residing at Lima, Allen county, Ohio, have invented certain new and useful Improvements in Reversible Hydrocarbon Generators and Burners, of which the following is a full, clear, and exact description.

In practice it has been found that at times it is not desirable to permit the fire to reach the pots or other objects on the stove to be heated, and to provide a means for preventing this is the object of my invention. This result I am enabled to attain by making the vaporizing-retort and the superheating-drums and vapor-shells reversible and supporting the same in both positions in such a manner that they may be readily removed and inverted. By constructing the apparatus in this way I am enabled to permit the fire to come in direct contact with the objects to be heated, or where desired cause the fire to be driven downwardly away from said objects and utilize only the heat produced thereby, and by means of the movably-supported mixing-plate the heat and flames may be still further controlled.

My invention consists in the novel features of construction hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming part of this specification, wherein like letters of reference indicate like parts, Figure 1 is a plan or top view of my improved reversible hydrocarbon generator and burner. Fig. 2 is a side view thereof, partly in section, and showing the vaporizing retort in the inverted position in dotted lines. Fig. 3 is a section on the line 3 3 of Fig. 1, and Fig. 4 is an enlarged detail top view of the reversible vaporizing-retort.

In the drawings, A designates the base, having a deep forward or pan portion B and surrounded by a flange C.

D is a frame corresponding in outline substantially to the base A, supported above the same upon tubular standards E and held securely in position by bolts F, passing through said standards E and the base A and nuts G, secured thereto beneath said base.

The bolts F should be slightly smaller in diameter than the interior of the tubular standards through which they pass, in order to create an air-space between the two and prevent the said bolts becoming ruined by the excessive heat.

At the opposite ends of the frame D are located upright supports H H, cast integral with the frame, and upon these a mixing-plate I is movably supported.

Upon the base A and within the limits of the frame D are arranged two sets of standards J J′, made integral with said base A and recessed upon their inner sides at the top to receive the reversible oxygen-superheating drums and vapor-shells K K, the same consisting of an outer oxygen-superheating drum L, having vertical sides closed at the top and provided with a series of apertures *a* and open at the bottom, and a centrally-disposed cylindrical vapor-shell M, made integral with the drum L, open at both ends and supported within said drum at its upper end by the closed top thereof, thus forming an annular space between said vapor-shell and superheating-drum into which the surrounding air is drawn and superheated when the apparatus is in operation.

N is the vaporizing-retort, which is flat and triangular in outline, deep along its edges to form the oil-receptacle T in both positions, and provided at its back with two small sections of pipe O O′, connected thereto opposite to each other. To the section O is connected the oil-supply pipe Q, having a valve Q′, and the other section O′ is closed with a cap S. The central portion of the vaporizing-retort is contracted and narrower in cross-section than the oil-receptacle, so as to form the vapor-chamber U. To this vapor-chamber is connected a vapor-delivery pipe P, having arms P′ P″, provided with outlets *d*, and in said vapor-chamber U, directly above the place where the pipe P enters the same, is a small recess *e*, to prevent the accidental sealing of the mouth of the vapor-delivery pipe P.

The vaporizing-retort N is supported on the frame D upon seats *b* and held firmly in either position by means of the hook-bolt F and lugs *c c'*, projecting upwardly from the frame D at the back thereof.

To start the apparatus it becomes necessary to place a quantity of asbestos in the pan B of the base, and after saturating the same with oil it is ignited. Thereupon the valve Q' is opened sufficiently to permit a small quantity of oil to enter the receptacle T of the retort N, and as the small quantity of oil will be distributed over so large an area in said retort in direct presence of the fire it will be almost immediately vaporized. In this connection it must be observed that as the vapor is generated more rapidly than consumed a great quantity will be compressed within the narrow vapor-chamber U, from which it will be conducted by the pipe P through the arms P' P'' and be forced under great pressure through the apertures *d* into the central vapor-shell portions M of the superheating-drums, above which the combustion will be rendered more perfect by the admixture of a large proportion of superheated oxygen issuing from the apertures *a* in the top of the drum L.

By means of the mixing-plate I, which is supported above the frame D by the uprights H H, the flames and heat may be directed to any desired part of the stove, and where the apparatus is arranged to operate in the reversed position it may be wholly removed by an ordinary stove-lid lifter, said plate I being provided with recesses for that purpose.

It will be observed that the oxygen-superheating drums, through the central shell portions of which the vapor passes, and the retort are not rigidly secured to their respective supports, the object thereof being to facilitate the removal and reversal thereof.

Where it is desired to operate the apparatus in the inverted position, it simply becomes necessary to remove the mixing-plate I, which is not needed in this position, then disconnect the oil-supply pipe Q from the pipe O, remove the cap S from the pipe O' and place the same upon the pipe O, loosen the hook-bolt F, reverse the retort N, so that the pipe P will be above the same, and then secure it in its reversed position by the bolt F. The oil-supply pipe Q is then connected to the pipe O' of the retort, and after reversing the superheating-drums K the apparatus will be in condition to be operated. The operation in this position will be the same as in the first, except that the vapor will be driven downwardly, the combustion take place beneath the superheating-drums instead of above the same, and the heat and flames be deflected by the base A instead of the mixing-plate I.

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

1. A hydrocarbon generator and burner comprising a supporting base, a frame corresponding in outline substantially to said base, standards secured to said base for supporting the frame above the same, a vaporizing retort reversibly supported upon said frame having a pipe provided with vapor outlets, and an oil supply pipe communicating therewith, and oxygen superheating drums, having vapor passages inclosed thereby, reversibly disposed in proximity to the vaporizing retort, and the vapor outlets in the pipes communicating therewith, substantially as specified.

2. A hydrocarbon generator and burner comprising a supporting base, having a deep forward or pan portion therein, a frame corresponding in outline substantially to said base, tubular standards secured to said base for supporting the frame above the same, said frame having upright supports at its opposite ends, a mixing plate movably supported thereon, a reversible vaporizing retort supported upon said frame, having a vapor delivery pipe provided with outlets communicating therewith and an oil supply pipe provided with a suitable valve adapted to be connected to said vaporizing retort in either position, and oxygen superheating drums having central vapor passages therein reversibly supported upon standards secured to the base, in proximity to the vaporizing retort, and the vapor outlets in the pipes communicating therewith, substantially as specified.

3. A reversible vaporizing retort comprising an oil receptacle portion having an oil supply pipe connected thereto, and a vapor compression portion communicating with and inclosed by said oil receptacle portion having a vapor delivery pipe connected thereto; said vapor compression portion being constructed narrower in cross-section than the surrounding oil receptacle portion so that when the retort is operated in either position the base of the oil receptacle portion will be on a lower level than that of the vapor compression portion, substantially as specified.

4. A reversible superheating drum having vertical sides, an open end and a closed end having a series of concentrically arranged apertures therein, said apertures being wide at the base and contracted at the mouth, and a cylindrical vapor shell, integral with the superheating drum, having a central passage provided with a contracted mouth, and supported at its top by the closed end of the superheating drum, substantially as specified.

5. A hydrocarbon generator and burner comprising the supporting base A having a deep forward or pan portion B, and a surrounding flange C, a frame D, tubular standards E for supporting the said frame above the base, a mixing plate I having uprights H, H for supporting the same secured to the opposite ends of the frame D, a reversible vaporizing retort

N supported upon the frame D on seats *b*, and held in position by lugs *c*, *c'* and hook-bolt F, an oil supply pipe Q having a valve Q', and a vapor delivery pipe P having arms P', P'' provided with vapor outlets *d*, communicating with said vaporizing retort, and reversible oxygen superheating drums K, K having central vapor passages M, M, supported in proximity to the vaporizing retort, and the outlets *d* in the pipes communicating therewith, upon standards J, J' secured to the base A, substantially as shown and described.

Signed at the city of New York, in the county and State of New York, this 27th day of February, 1895.

BENJAMIN G. DEVOE.

Witnesses:
GUSTAVE DIETERICH,
JOHN KEHLENBECK.