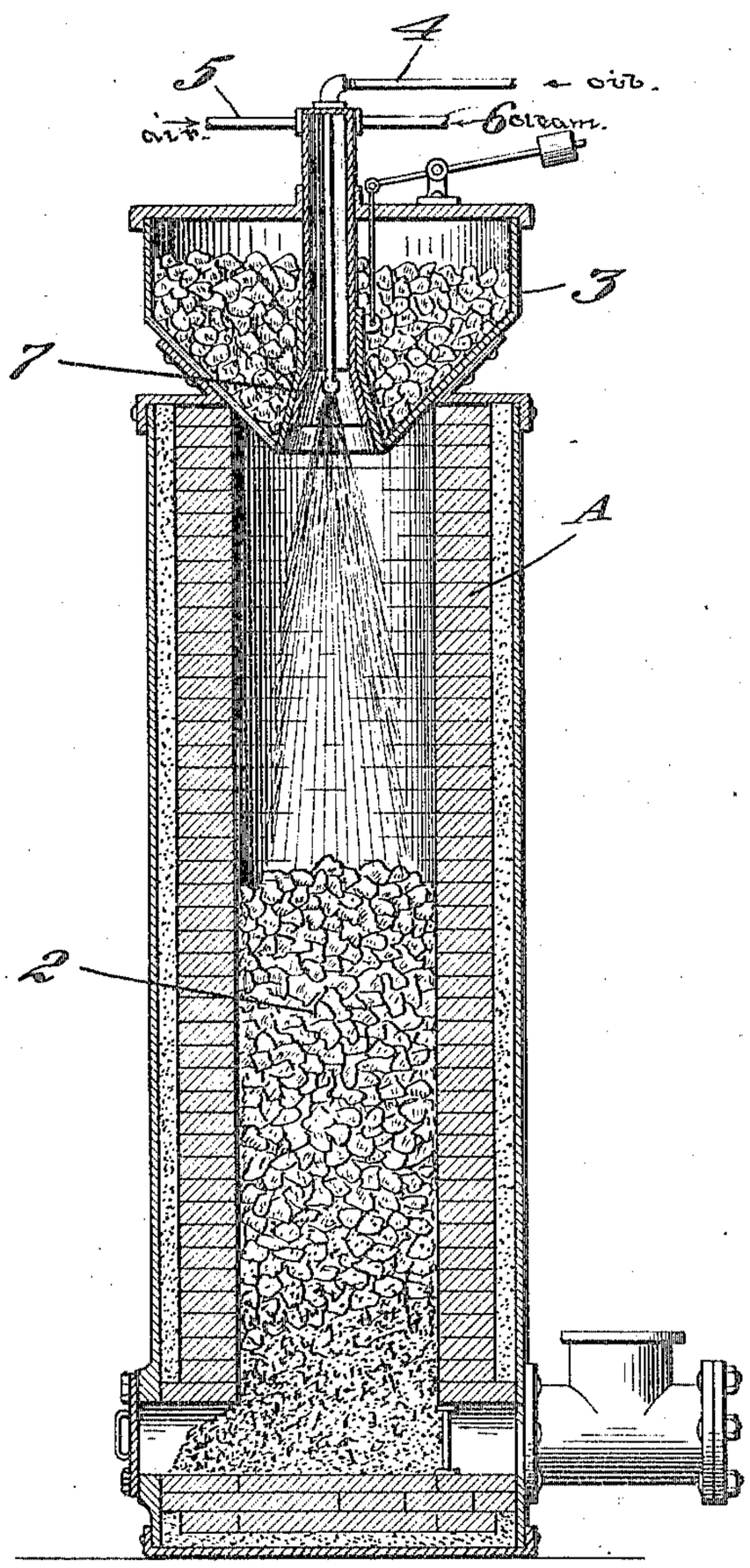
E. N. PERCY.

OIL GAS APPARATUS.

APPLICATION FILED JULY 3, 1909.

951,512. Patented Mar. 8, 1910.




WITNESSES:

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# UNITED STATES PATENT OFFICE.

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## OIL-GAS APPARATUS.

951,512. Specification of Letters Patent. Patented Mar. 8, 1910.

Application filed July 3, 1909. Serial No. 505,865.

*To all whom it may concern:*

Be it known that I, EARL N. PERCY, citizen of the United States, residing in the city and county of San Francisco and State of California, have invented new and useful Improvements in Oil-Gas Apparatus, of which the following is a specification.

My invention relates to a means for obtaining gas of that class known as "producer gas", from the combined action of an incandescent carboniferous fuel, and a spray or jet of ignited oil directed upon and through said fuel.

It also consists in details which will be more fully explained in the following specification.

The figure is a vertical sectional view of an oil gas apparatus showing my invention.

My invention is designed to first burn the oil or liquid hydrocarbon either wholly or partially, and to pass the products of combustion, which accompanying heat, over or through the solid carboniferous fuel, which may consist of coke, charcoal, or under certain conditions, lignite, peat, wood, or anything which will carbonize, and to form layers of incandescent carbon for the products of combustion of the oil to pass through. Such a gas is similar to producer gas, which is evolved from coal gas producers, but is considerably richer.

In carrying out my invention the oil is burned in conjunction with air, and if desired, steam may also be employed.

As shown in the drawing, A is a stack or chamber containing in the lower part a carboniferous fuel 2. At the top of the stack is a closure 3, through the center of which enters an oil discharge pipe 4. Exterior to this pipe are air and steam inlet pipes, as 5 and 6, and the lower end is made divergent or funnel-shaped, as shown at 7. Oil being admitted through the inlet pipe is ignited and discharged in a divergent jet or spray, being burned as it passes downwardly, and strikes the top of the carboniferous fuel which is soon ignited and raised to an incandescent state.

The products of combustion of the oil consist of carbonic acid gas ($CO_2$) and other gases, and these gases pass through the layers of fuel which is thus rendered incandescent. As the $CO_2$ passes through this carbon it takes up another atom of carbon and becomes carbonic oxid (CO) which is a combustible gas. If steam be admitted it acts in a well known manner to enrich the gas with free hydrogen and more carbonic oxid, and furthermore, prevents clinker from forming.

If the combustion of the oil is incomplete, the unburned parts will be delivered at a point where the flame impinges, in the form of particles of oil, tar, lampblack, and other heavy constituents. Under the influence of the heat these will all be reduced to lampblack, coke, vapor, gases, and clinker, and tend in a measure to replace the coke which furnishes the additional atom of carbon to unite with the carbonic acid gas, and oxygen produced by the steam. The gases and products of this operation pass through the fuel bed, coming out at the bottom as permanent gases, clinker, and a small amount of free carbon and condensable vapors. The gas after leaving the apparatus is washed and purified, and is intended primarily for gas engines, furnaces, etc., but may be subjected to special treatment to fit it for illuminating purposes.

This invention may be employed in either a suction or a pressure apparatus. Any suitable provision may be made for feeding the solid fuel without letting in fresh air, and also for removing clinker, ash, and other debris.

In the drawing, the closure 3 is in the form of a hopper or container having the lower part convergent to meet the divergent funnel 7. This container has a removable cover or opening through which it may be charged, and a gate in the lower part through which solid fuel may be admitted into the main chamber A, as required.

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

An apparatus for manufacturing gas, said apparatus comprising a retort having a vertical chamber with a gas outlet at the bottom; a solid fuel hopper at the top, having a lower cone-shaped end entering the top of said chamber, said hopper having a central tubular portion whose lower end diverges downwardly; an oil supply pipe passing through said tubular portion of the hopper and adapted to discharge a divergent spray into the top of said chamber and downwardly thereinto; and air and steam pipes entering the central tubular portion of the

hopper and discharging in the said divergent portion thereof in juxtaposition with the oil supply pipe, whereby the steam and air may be commingled with the spraying oil and directed downwardly into the chamber of the retort.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

EARL N. PERCY.

Witnesses:
GEO. H. STRONG,
CHARLES EDELMAN.