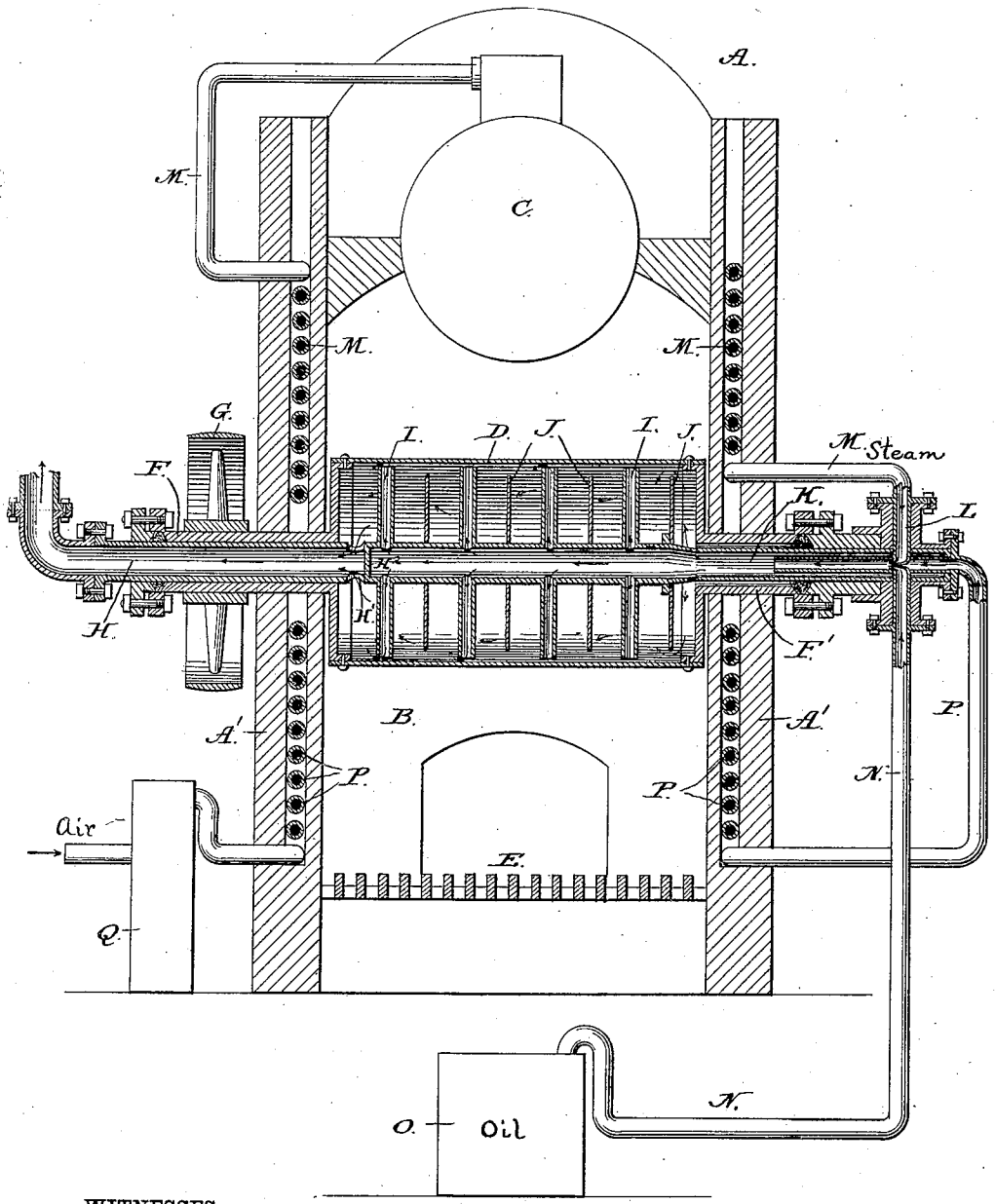
(No Model.)

A. A. HARWOOD.

APPARATUS FOR GENERATING GAS.

No. 356,247. Patented Jan. 18, 1887.



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UNITED STATES PATENT OFFICE.

ALPHRANZO A. HARWOOD, OF SCOTTDALE, PENNSYLVANIA.

APPARATUS FOR GENERATING GAS.

SPECIFICATION forming part of Letters Patent No. 356,247, dated January 18, 1887.

Application filed June 2, 1886. Serial No. 203,921. (No model.)

To all whom it may concern:

Be it known that I, ALPHRANZO A. HARWOOD, of Scottdale, in the county of Westmoreland and State of Pennsylvania, have invented a new and Improved Apparatus for Generating Gas, of which the following is a full, clear, and exact description.

The object of my invention is to provide a new and improved apparatus for generating gas by mixing hot air, oil, and superheated steam.

The invention consists in the peculiar construction and arrangement of parts, as will be hereinafter fully described, and pointed out in the claims.

Reference is to be had to the accompanying drawing, forming a part of this specification, in which the figure represents a vertical cross-section of my improvement.

The furnace A, of suitable construction, is provided with the usual fire-place, B, and the boiler C. A retort, D, is situated in the fire-place B, above the grate-bars E, and is attached at the ends to the hollow shafts F and F′, respectively, which shafts have their bearings in the side walls, A′, of the furnace A. The hollow shaft F is provided on the outside of the furnace A with the pulley G, by means of which the retort is rotated. The stationary pipe H passes through the shafts F and F′, and through the retort D, and is provided on the part in the retort with the curved branch pipes I and the intermediate deflecting and retarding plates or disks, J. The apertures H′ are formed in the periphery of the pipe H, near one end of the retort D, and a partition, H², is placed into the pipe H, near the apertures H′.

To one outer end of the stationary pipe H is secured a head, L, into the upper end of which leads the pipe M, coiled in the walls of the furnace, passing through the air-space in the furnace, and connecting with the dome of the boiler C, so that the steam from the boiler C, passing through the pipe M, is superheated when it reaches the head L.

The pipe N enters the head L on the side opposite to that on which the pipe M enters said head, and is connected with the pump O, which forces a continuous stream of oil into the pipe N and into the head L. The pipe P is connected with the center of the head L, and is coiled around the fire-place in the side walls of the furnace A, and it connects at its other end with a fan or air-compressor, Q, which forces a constant stream of air (which is heated by its passage around the fire-place of the furnace) into the head L.

It will be seen that the superheated steam, the hot air, and the oil pass at the same time into the head L, and are forced into the pipe H, which discharges into the revolving and heated retort D.

The steam, air, and oil are thoroughly mixed in the revolving retort D, and the generated gas passes through the opening H′ into the pipe H, and out of the same at its outer end.

The gas generated by this method can be used for various purposes.

I am aware that it is old to generate gas from an admixture of a hydrocarbon, steam, and heated air, and I am also aware that a revolving retort is old, and I therefore do not claim such inventions. In my apparatus I employ a retort which revolves around a stationary pipe provided with radial pipes extending to within a short distance of the inner surface of the retort, and with deflecting and retarding plates or disks between the radial pipes, whereby the steam, air, and oil will be thoroughly mixed and heated. By my construction, also, the mixture of steam, air, and oil being delivered into the retort through the radial pipes against the inner surface of the same, it is greatly protected from the heat, and consequently will last much longer.

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

1. In an apparatus for generating gas, the combination, with a furnace, a retort journaled in the same, and means for revolving the retort, of a pipe for conducting steam, air, and oil in the retort, extending through the said retort, and provided with radial pipes, and intermediate deflecting and retarding plates or disks, substantially as herein shown and described.

2. In an apparatus for generating gas, the combination, with a furnace, a retort journaled in the same, and means for revolving the retort, of a pipe for conducting steam, air, and oil into the retort, extending through the said

retort, and provided with radial pipes, intermediate deflecting and retarding plates or disks, a partition at one end, and apertures between the partition and the end of the retort, substantially as herein shown and described.

3. In an apparatus for generating gas, the combination of a furnace, a retort journaled in the same, means for revolving the retort, a pipe extending through the retort and provided with radial pipes, intermediate deflecting and retarding plates or disks, apertures near one end of the retort and a partition near the apertures, and pipes for conducting superheated steam, hot air, and oil into the pipe, extending through the retort, substantially as herein shown and described.

4. An apparatus for generating gas, consisting of the furnace A, the retort D, mounted therein, means for revolving the retort, the pipe H, constructed as described, and extending through the retort, the head L, attached to the said pipe, and the steam, hot-air, and oil pipes M N P, connected with the said head L, the pipes M and N being located in the walls of the furnace, substantially as described.

ALPHRANZO A. HARWOOD.

Witnesses:
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