G. W. HARRIS & A. L. ALLEN.

Apparatus for the Manufacture of Gas.

No. 209,563. Patented Nov. 5, 1878.

Fig. 1

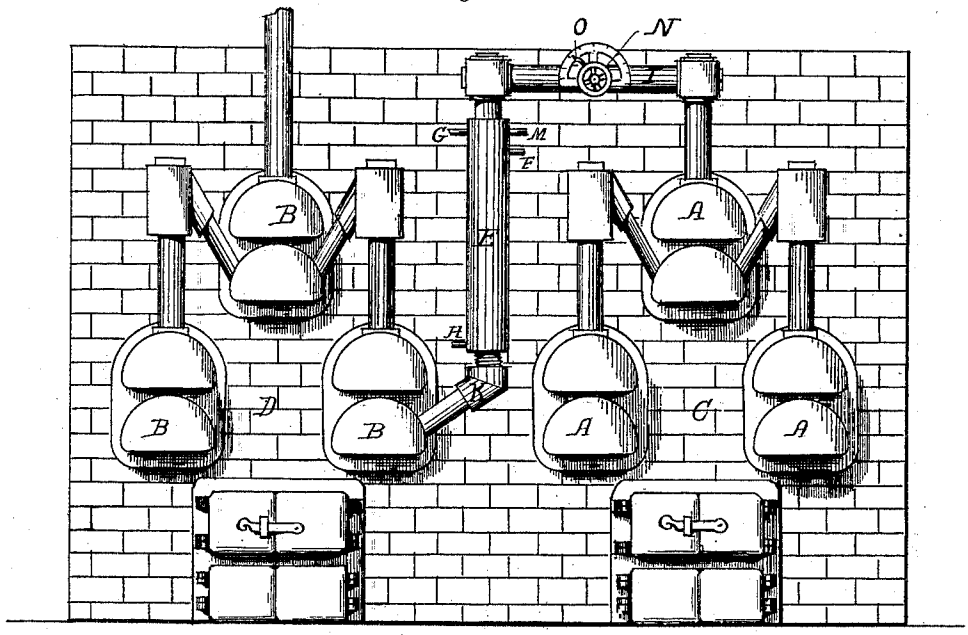


Fig. 2

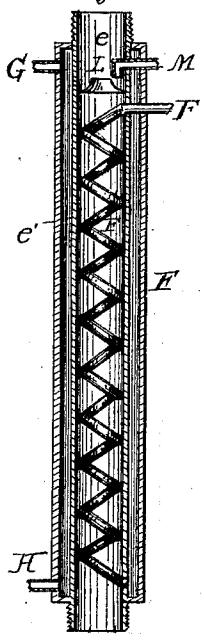


Fig. 4.

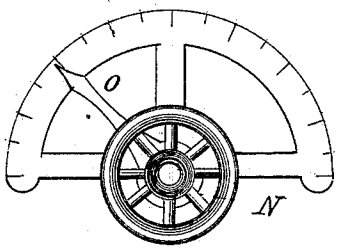
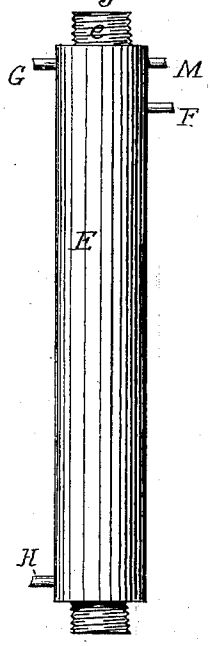


Fig 3



Witnesses

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UNITED STATES PATENT OFFICE.

GEORGE W. HARRIS AND AUGUSTUS L. ALLEN, OF POUGHKEEPSIE, N. Y.

IMPROVEMENT IN APPARATUS FOR THE MANUFACTURE OF GAS.

Specification forming part of Letters Patent No. **209,563**, dated November 5, 1878; application filed July 11, 1878.

To all whom it may concern:

Be it known that we, GEORGE W. HARRIS and AUGUSTUS L. ALLEN, of Poughkeepsie, in the county of Dutchess and State of New New York, have invented certain new and useful Improvements in Apparatus for the Manufacture of Gas; and we do hereby declare that the following is a full, clear, and exact description thereof, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification.

This invention relates to certain improvements in the manufacture of gas for heating and illuminating purposes, and is particularly designed to be employed in connection with what is known as the "Allen-Harris" or "American hydrocarbon" process of manufacturing gas, in which the gas is produced by the decomposition of water by means of highly-heated carbon, and afterward enriched by distilling with it petroleum or other liquid hydrocarbon to secure the necessary illuminating properties.

To this end our invention consists, first, in the combination, with the steam decomposing and carbureting retorts, of a vaporizer consisting of an externally-jacketed tube, provided with an internal coil of pipe, connected at one end with a steam-generator and at the other with the jacket, the latter being provided with a suitable exhaust-pipe, whereby a thorough circulation of the steam through the coil and jacket is effected; second, in the combination, with the steam decomposing and the carbureting retorts, of a vaporizer heated internally or externally, or both internally and externally, and provided with an oil-inlet at its upper end, whereby the oil may be distributed downward through the vaporizer, through which a current of gas is passed, as more fully hereinafter set forth; third, in the combination, with the inner tube of the vaporizer, of an annular cup or receptacle, having a raised central edge, into which the oil is fed, and from which it is distributed in a tubular shower through the vaporizer; and, fourth, in the combination, with the inner tube, of the vaporizer, its coiled pipe and jacket connected with a steam-generator, the annular distributing-cup, and feed-pipe, all constructed and arranged as more fully hereinafter set forth.

In the drawings, Figure 1 represents a front elevation of the retorts, arranged in two benches, in one of which the water is decomposed and in the other of which the final distillation of the gas and vapor is effected, the vaporizer being represented as located between the two benches. Fig. 2 represents a sectional view of the vaporizer. Fig. 3 represents an elevation of the vaporizer, and Fig. 4 a detached view of the index-valve.

The letters A B represent two benches of retorts, mounted in the furnaces C D, in the manner usually practiced in the manufacture of gas by the Allen-Harris process. The letter E represents the vaporizer, consisting of a tube, *e*, having a coiled pipe, F, extending through it, and provided with a jacket, *e'*, on its outside, which is provided with pipes G H, by means of which it may be connected with a boiler or steam-generator. The upper end of the pipe *e* is connected, by means of a pipe, I, with the bench of retorts A, in which the water-gas is generated, and at its lower end with the bench of retorts B by means of a pipe, K.

In the upper part of the pipe *e*, above the entrance of the coiled pipe F, is located an annular cup, L, into which the hydrocarbon is conducted from a suitable reservoir by means of a pipe, M, and from which it is distributed downwardly into the pipe *e* and through the same.

The letter N represents an index-valve located in the pipe I, which connects the retorts A with the vaporizer. Said valve is provided with a segmental scale, graduated as shown, and the valve-cock is provided with finger or pointer O, by means of which the extent to which the valve is opened is indicated, furnishing a ready means of controlling and regulating the flow of gas into the vaporizer.

The coiled pipe F communicates at its upper end with a steam-generator and at its lower end with the space between the pipe *e* and the jacket surrounding it, the waste-steam, after passing through said pipe and entering said jacket, escaping therefrom through the escape-pipe H.

The operation of our invention is as follows:

The water-gas is generated in the retorts A, and passes therefrom into the vaporizer, and through the same to the retorts B. While thus passing through the vaporizer a current of liquid hydrocarbon, such as pretroleum or its distillates, is admitted into the annular cup, and from thence distributed downwardly into the vaporizer. During the operation the vaporizer is kept heated by a current of steam through the jacket and coiled pipe, which vaporizes the hydrocarbon, the vapor commingling with the gas passing through the vaporizer, and being carried thereby into the retorts B, where the two are distilled, forming a permanent gas.

It is evident that the above-described improvements may be employed in connection with any other kind of furnace and retorts, and with retorts set in benches of any description, whether vertical or horizontal. Therefore we do not limit ourselves to any particular description of furnace or retorts, or to any particular arrangement of benches.

Our improved vaporizer differs from others heretofore employed for vaporizing hydrocarbons in the arrangement of the inner tube, coil, and jacket, which are so connected to each other and to a steam-generator that a constant current of steam will be kept up through the coil and jacket; and, furthermore, in that the oil is supplied at the top instead of at the lower part of the vaporizer, thus leaving a free and unobstructed passage for the gas.

What we claim is—

1. In combination with the steam decomposing and carbureting retorts, a vaporizer consisting of an externally-jacketed tube provided with an internal coil of pipe, connected at one end with a steam-generator and at the other with the jacket, the latter being provided with a suitable exhaust-pipe, whereby a thorough circulation of the steam through the coil and jacket is effected, substantially as specified.

2. In combination with the steam d omposing and the carbureting retorts, a vaporizer heated internally or externally, or both internally and externally, and provided with an oil-inlet at its upper end, whereby the oil may be distributed downward through the vaporizer, through which a current of gas is passed, substantially as and for the purposes specified.

3. In combination with the tube *e*, the annular cup or receptacle, having a raised central edge, into which the oil is fed, and from which it is distributed through the vaporizer in a tubular shower, substantially as specified.

4. The combination of the tube *e*, its coiled pipe and jacket connected with a steam-generator, the annular distributing-cup, and feed-pipe, all constructed and arranged substantially as specified.

In testimony that we claim the foregoing as our own we hereunto affix our signatures in presence of two witnesses.

GEO. W. HARRIS.
AUGUSTUS L. ALLEN.

Witnesses:
JAMES M. HADDEN,
JAMES TEAGUE.