

No. 618,549.

P. A. N. WINAND.
GAS GENERATOR.

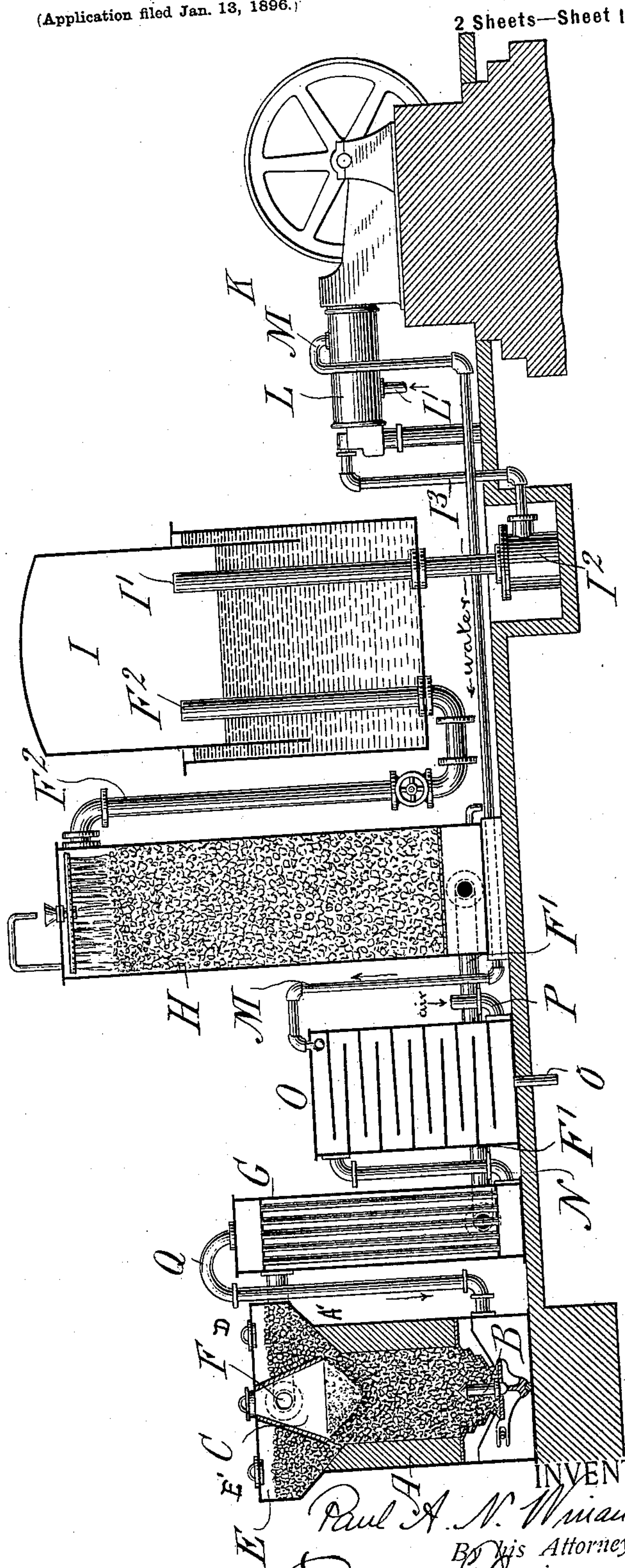
(Application filed Jan. 13, 1896.)

Patented Jan. 31, 1899.

(No Model.)

2 Sheets—Sheet 1.

Fig. 1.



WITNESSES:
C. E. Ashley
W. L. Lloyd

INVENTOR:
Paul A. N. Winand
By his Attorneys
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2 Sheets—Sheet 2.

Fig. 3.

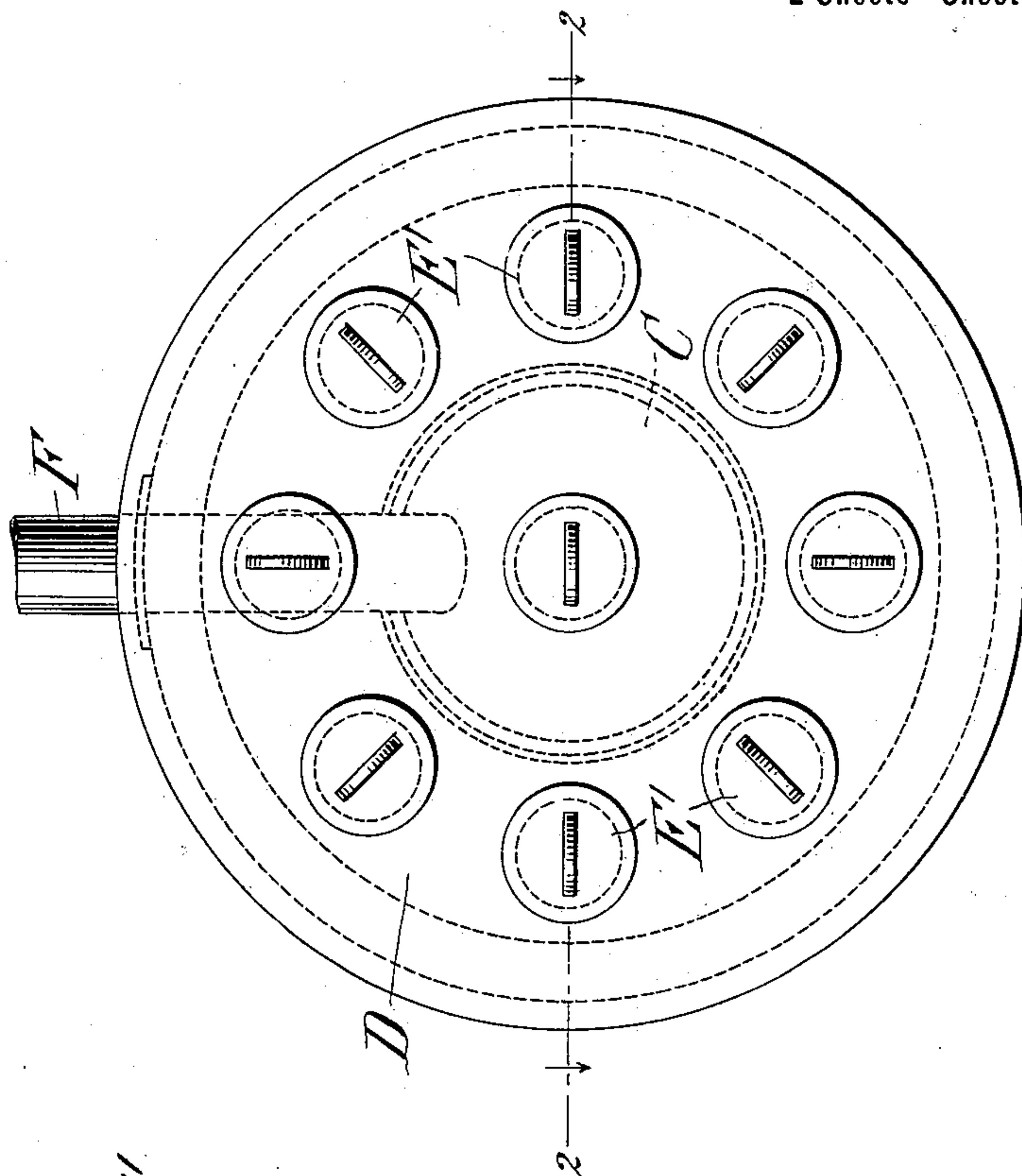
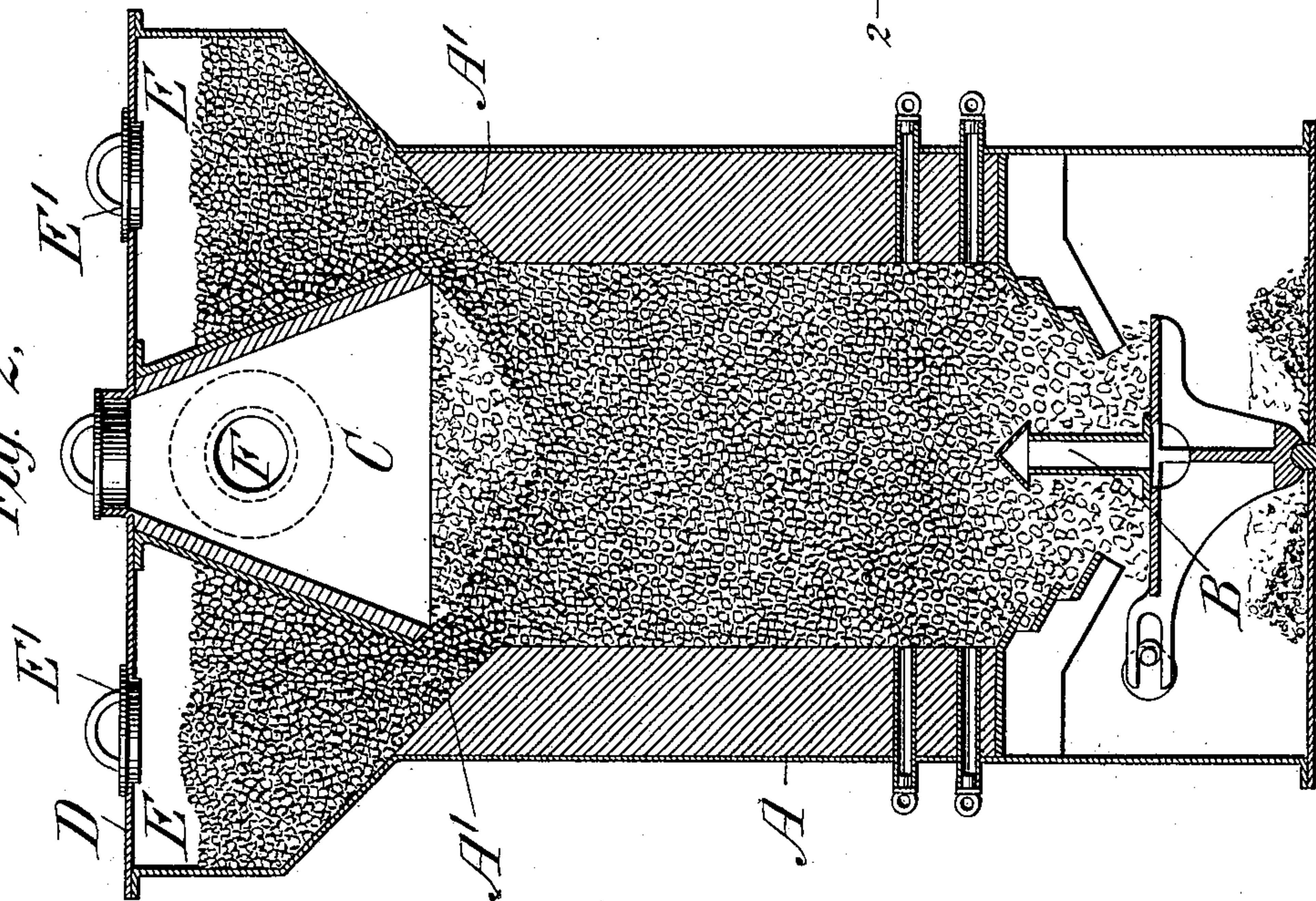


Fig. 2.



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H. W. Lloyd

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Baldwin, Davidson & Wright

UNITED STATES PATENT OFFICE.

PAUL A. N. WINAND, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO
THE OTTO GAS ENGINE WORKS, OF SAME PLACE.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 618,549, dated January 31, 1899.

Application filed January 13, 1896. Serial No. 575,363. (No model.)

To all whom it may concern:

Be it known that I, PAUL A. N. WINAND, a subject of the King of Belgium, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for Supplying Gas-Engines with Fuel, of which the following is a specification.

The object of my invention is to provide an organization involving a producer with appropriate apparatus, a receiver, and a water-jacketed gas-engine taking gas from the receiver in which I may economically produce gas suitable for the engine of substantially uniform quality and in which the engine co-operates with the producer apparatus to insure the production of gas of a substantially uniform quality in an efficient and economical way; and to this end my invention also contemplates certain improvements in the generator or producer.

In the operation of gas-engines gas and air admitted to the combustion-chamber or cylinder and forming an explosive mixture are admitted in regulated quantities determined by the adjustment of the valve. It is therefore desirable that a uniform quality of gas should be supplied to the engine. Where such engines have been fed with a good grade of illuminating-gas, good results have been obtained, the gas being of substantially uniform quality. In cases, however, where producer-gas is specially made to supply the engine the results have not, so far as I am aware, been equally satisfactory.

My invention therefore consists, first, of a generator of peculiar construction, hereinafter described, and, second, in an arrangement whereby the hot water, which during the run of an engine leaves the jacket thereof at a substantially uniform temperature, is caused to pass in contact with the air admitted to the generator for the production of producer-gas, the result being that the air takes up from the uniformly-heated water a substantially uniform volume of moisture or watery vapor. The blast admitted to the generator is therefore substantially uniform in quality, and the producer-gas generated is to a corresponding extent of substantially uniform quality.

In the accompanying drawings, which illustrate my invention, Figure 1 is a diagrammatic view, partly in longitudinal section and

partly in elevation, illustrating the complete organization and apparatus; Fig. 2, a vertical longitudinal section, on an enlarged scale, of the producer or generator; and Fig. 3, a plan view thereof.

The generator A consists of a shell and interior walls, as shown, and has an ordinary grate and ash-pit, but is provided with a central blast at the base of the column of fuel. The general construction of the lower part of the generator is substantially the same as that disclosed in my Letters Patent No. 474,202, and detailed description is therefore unnecessary. At the upper part of the generator the interior walls are preferably beveled or sloped from the shell downwardly to the chamber of the generator, as indicated at A', and the shell above this point may be of larger diameter, as indicated. A bell, dome, or inverted vessel C, supported by the top plate D, is arranged centrally with reference to the axis of the generator. An opening in the top plate provided with a suitable cover affords access to the generator through the bell. The annular chamber E, formed between the bell or dome and the shell and top plate, constitutes an annular fuel-reservoir, to which access may be had for the introduction of fuel through openings in the top plate provided with ordinary removable covers E'. The gas-outlet pipe F may pass laterally through the shell of the generator and connect with the interior of the bell C. The solid fuel from the annular reservoir is fed circumferentially to the producer-chamber of the generator and passes thereinto between the edge of the bell and the sloping top of the interior walls and will tend to arrange itself as indicated in the drawings—that is to say, the surface of the fuel will slope downwardly from the edge of the bell to the center of the generator-chamber. The blast being introduced centrally will in greater part tend to travel through the center of the column of fuel, and the quantity passing through the fuel will decrease from the axial line of the generator as the interior wall thereof is approached. I have found that such an organization produces substantially improved results, in that the production of clinkers and the formation of channels or passages in the fuel, which usually occur adjacent to the walls, are to a great ex-

tent obviated. The producer-gas or products of the combustion are received in the vessel C, from whence they pass to the pipe F, the general operation being as usual, and the ordinary exhaust or blower fan may be employed.

In Fig. 1 I have shown my improved generator connected in the complete organization contemplated by my invention. The gas-outlet pipe F passes to an ordinary superheater G, which, however, is not an essential feature of my invention, and from thence the gas passes by the pipe F' to the base of a scrubber H of ordinary construction and which also is not an essential feature of my organization. From the scrubber the gas passes by pipe F² to the holder I of ordinary construction. Gas is taken from the holder I through the connections I' I² I³ to the engine K, to the cylinder or combustion-chamber of which it is admitted by the usual valve or valves in any ordinary way. L is the water-jacket of the cylinder, to which water is admitted from any suitable source through the pipe L', and water leaves the jacket by the pipe M, from whence it passes to the top of a moistener O. The particular construction of the moistener may be varied, and no particular construction is an essential feature of my invention, provided this piece of apparatus admits of the proper and sufficient contact between the air and uniformly-heated water delivered from the jacket of the cylinder by the pipe M. In the drawings I have shown a moistener consisting of a shell with plates projecting horizontally from the walls thereof in alternating series, those of one series projecting from one wall and those of the other series projecting from the other wall. A tube o conveys the surplus water from the base of the moistener, and a pipe P admits air from any suitable source, as from the atmosphere, to the base of the moistener. The air passes up through the sinuous passage-way afforded by the overlapping alternating plates, while the uniformly-heated water from the engine passes down such passage-way over and along the plates. There is therefore an exchange of temperature between the water and the air, and since the water is of substantially uniform temperature it will deliver up to the air and the air will absorb a quantity of moisture or watery vapor, such as to make the air, whatever its previous condition may be, of substantially uniform quality as to temperature and moisture. The combined air and watery vapor passes from the top of the moistener by a pipe N to the base of the superheater G and, passing upwardly through the tubes thereof to the upper chamber, is delivered by pipe Q to the blast-inlet B at the base of the generator or producer.

The general operation of the apparatus will be apparent from this description and from the drawings, and further detailed description seems unnecessary.

I have stated that the scrubber was not an

essential feature of the invention, because in some cases it may be omitted and the gas delivered directly to the holder. I have also stated that the superheater is not an essential feature, since in some cases it may be omitted and the uniformly-heated water supplied to the moistener from the water-jacket of the engine may be of such temperature that the air and watery vapor passing by pipe Q to the blast-inlet of the generator may be sufficiently hot. I prefer, however, to use the superheater in most cases.

It will be apparent that the organization which I have described is an economical one, aside from the considerations already stated, because it utilizes the waste heat from the cylinder of the engine that would otherwise be lost.

I claim as my invention—

1. The combination, substantially as set forth, of a water-jacketed gas-engine, a moistener, a producer, a connection for conveying the heated water from the jacket of the engine to the moistener, a connection for admitting air to the moistener to cause it to come in contact with the heated water from the jacket of the engine, and a connection for conveying the air and absorbed watery vapor from the moistener to the producer.

2. The combination, substantially as set forth, of a water-jacketed gas-engine, a moistener, a producer, a connection for conveying the heated water from the jacket of the engine to the moistener, a connection for admitting air to the moistener to cause it to come in contact with the heated water from the jacket of the engine, a connection for conveying the air and absorbed watery vapor from the moistener to the producer, a holder for the generated gas and a connection between the generator and the holder and between the holder and the combustion-chamber or cylinder of the engine.

3. A gas generator or producer comprising a shell, walls and top plate, a centrally-arranged bell supported by the top plate whereby an annular solid-fuel reservoir is formed, a gas-outlet connected laterally with the bell and a central opening in the top of the bell provided with a suitable cover.

4. A gas generator or producer having an annular reservoir feeding solid fuel circumferentially to the generator-chamber, a top plate provided with a series of openings for the introduction of fuel to the annular reservoir, a centrally-arranged bell supported by the top plate and having downwardly-diverging walls, a gas-outlet connected laterally with the bell, and a central opening in the top of the bell provided with a suitable cover.

In testimony whereof I have hereunto subscribed my name.

PAUL A. N. WINAND.

Witnesses:

R. S. REED,
ISAIAH MATTOCK.