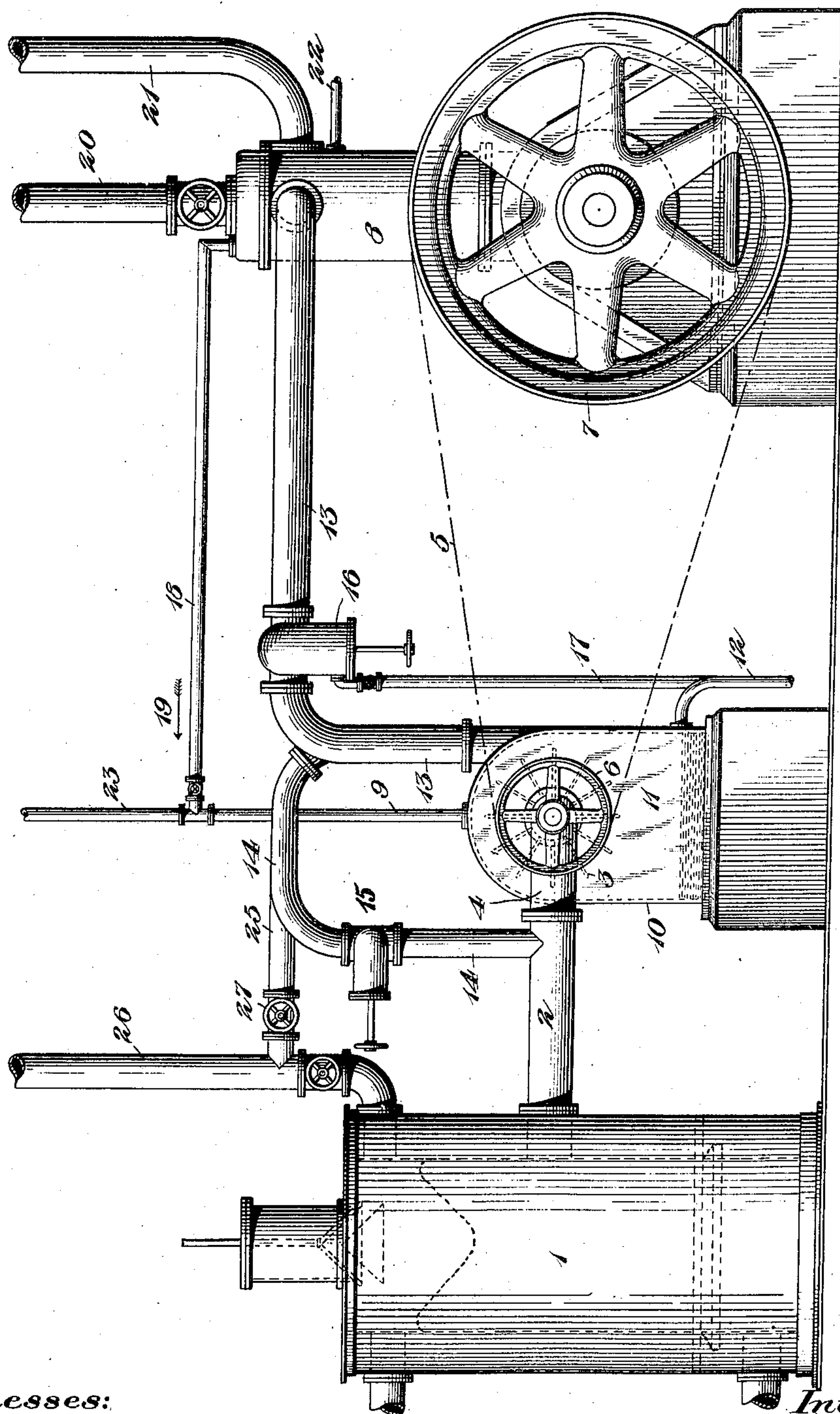


No. 847,054.

PATENTED MAR. 12, 1907.

P. EYERMANN.
PRODUCER GAS PLANT.
APPLICATION FILED JULY 21, 1905.



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PRODUCER-GAS PLANT.

No. 847,054.

Specification of Letters Patent.

Patented March 12, 1907.

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To all whom it may concern:

Be it known that I, PETER EYERMANN, a citizen of the United States, residing at Beloit, in the county of Rock and State of Wisconsin, have invented a new and useful Improvement in Producer-Gas Plants, of which the following is a specification.

My invention relates to improvement in apparatus for the purpose of cleaning, cooling, and storing gas. The gas from any producer-gas plants manufacturing lean power or heating gas having a heating value of not more than 200 BTU may thus be treated for the use especially in internal combustion engines, but equally well adapted for other gas-consuming appliances, like furnaces, &c. I attain these objects by the mechanisms illustrated in the accompanying drawing, in which—

Figure 1 is a vertical longitudinal view through a producer-gas plant in accordance with my invention, parts being shown in elevation and applied to a gas-engine of the vertical type.

Similar letters refer to similar parts throughout the drawing.

As is generally known, the gases escaping from producers are first passed through scrubbers. They are generally in use, and no producer-gas plant is known to me to-day which would have no scrubber. These scrubbers consist generally of stationary or slowly-rotary tank filled with coke or other porous matter and provided with water-injectors of any description. Therein the gas is cleaned and cooled to a certain degree. Two main groups of producer-gas plants are built to-day. As well known, the suction producer-gas plant of to-day requires between the producer and the consumer only a wet scrubber and sometimes a dry purifier and besides to a certain extent a gas-reservoir. The pressure producer-gas plant requires, however, the wet scrubber, the dry purifier, sometimes a fan, similar to my Patent No. 785,724, and a holder, the latter similar to those as known in illuminating-gas plants. These scrubbers and holders or reservoirs are very heavy and require mostly much floor space and room. According to my invention these means are entirely avoided, which means reducing the parts between the producer and the consumer, thus cheapening the producer-gas plant and reducing the weight and room considerably. I obtain this improvement by connecting the fan

according to Patent No. 785,724 directly to the gas-escape pipe from the producer and installing a connection between the second or auxiliary pipe 24, as described in the said patent and shown in Fig. 1 and Fig. 2, and the said escape from the producer.

The gas-producer of any description may have the gas-escape pipe or flue 2. The gas escaping from the producer is very warm, sometimes incandescent hot, and goes now, according to my invention, directly in the fan 3 by pipe 4. This fan is directly driven by belt 5 and pulley 6 from a pulley or the fly-wheel 7 of the gas-engine 8. If the gas-engine 8, driven from the gas of said fan, produces electricity, then it may be, according to conditions, advisable to drive the fan by an electric motor. Said fan can be driven also by power from any other source or by a smaller gas-engine, using the same gas. This fan is provided with a water-supply pipe 9. The water is used inside of the fan for cooling and cleaning and may be injected in the casing 10 by any convenient device. The fan-blades may be of any desired shape. The waste water is stored in the lower part of the fan-casing 11 or in a connected vessel and overflows through pipe 12 to a water-trap, as generally known, and therefore not shown in drawing. It is now evident that four distinct actions take place inside of said fan: (A) suddenly and intensely cooling of the gas by the injected cold liquid; (B) thoroughly cleaning of the gas; (C) the volume of the escaping hot gas of the producer is considerably reduced by passing through that fan; (D) the low-pressure gas from the producer is converted in gas of higher pressure for the consumer by the action of said fan. This fan is provided with a by-pass pipe 14, which branches off from the main gas-pipe 13. The surplus of gas from the fan flows back in the supply or suction pipe 2 from the producer to the fan. This circulating-pipe 13 may be controlled by a valve 15 in any desired place. There is to note now, as another main point in my invention, that this by-pass serves to a certain degree here as a gas-holder by equalizing the pressure. A certain cleaning of the gas takes place in this fan device. That portion of the gas which has been passing through the circulating-pipe 14 is cleaned and stored over and over again by passing through the fan. The points of my invention are therefore the use of said fan instead of a scrubber and in addition a by-pass in

lieu of the gas-holder. The other auxiliary details, as shown on Fig. 1, are described as follows: Water-vapor or particles of water which might escape with the gas may be drained out from an inserted casing 16 by a pipe 17, and the controlling gas-valve may be placed in the same casing. If required, dry sawdust purifiers may be installed in the main gas-pipe 13 on any convenient place. These purifiers are not shown in drawing, as their construction is generally known. Under certain conditions it might be desired to use parts of the wasted cooling-water for the above-described cleaning purpose or any other liquid which may be used for cooling the gas-engine. A pipe connection 18 is provided for this purpose, and the required liquid for the fan flows then in the direction of the arrow 19. The air for the internal-combustion engine is sucked by an air-pipe 20 or supplied in any other way. The exhaust of the engine is at 21 and the main cooling-water-supply pipe at 22 for the engine and at 23 for the fan. Another auxiliary device is shown in this gas power plant in Fig. 1 by installing a connection-pipe 25 between the chimney 26 of the producer and the gas-escape pipes 13 or 14 from the fan. This second by-pass is sometimes desirable for relieving of gas directly to the atmosphere. The quantity of this gas can be regulated by a valve 27. It is also possible to connect the gas and waste-gas pipes 21 25 26 in one pipe. (Not shown in drawing, as this arrangement depends from local conditions.)

Although I have shown my improved producer-gas plants in some detail, I would have it understood that this invention is subject to many changes and modifications which can be introduced by those familiar with the art. Such substitutions or equivalents, however, are to be considered within the scope of my invention.

What I claim, and desire to secure by Letters Patent, is—

1. In combination with the gas-producer and connected with the gas-outlet pipe therefrom, a suction-fan having water-injecting devices and a suitable gas-outlet pipe therefrom, a circulating relief-pipe connected to the gas-outlet from the fan, and connected to the gas-outlet pipe from the producer, substantially as described.

2. In combination with the gas-producer and connected with the gas-outlet pipe therefrom, a suction-fan having water-injecting devices and a suitable gas-outlet pipe therefrom, a circulating relief-pipe connected to the gas-outlet from the fan, and connected to the waste-gas pipe from the producer, substantially as described.

3. In combination with the gas-producer and connected with the gas-outlet therefrom, a suction-fan having water-injecting devices and a suitable gas-outlet pipe therefrom, a circulating relief-pipe connected to the gas-outlet from the fan, a connection to the gas-consumer, to the gas-outlet pipe from the producer and to the waste-gas pipe from said relief-pipe, substantially as described.

4. In combination with the gas-producer and the gas-consumer a suction-fan having suitable gas-inlet and gas-outlet pipes therefrom and water-injecting and waste-water-overflow pipes, a circulating relief-pipe connected to said gas-pipes and means in these pipes for controlling the quantity and for operating the plant, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two witnesses.

PETER EYERMANN.

Witnesses:

B. P. ELDRED,

F. L. BUSH.