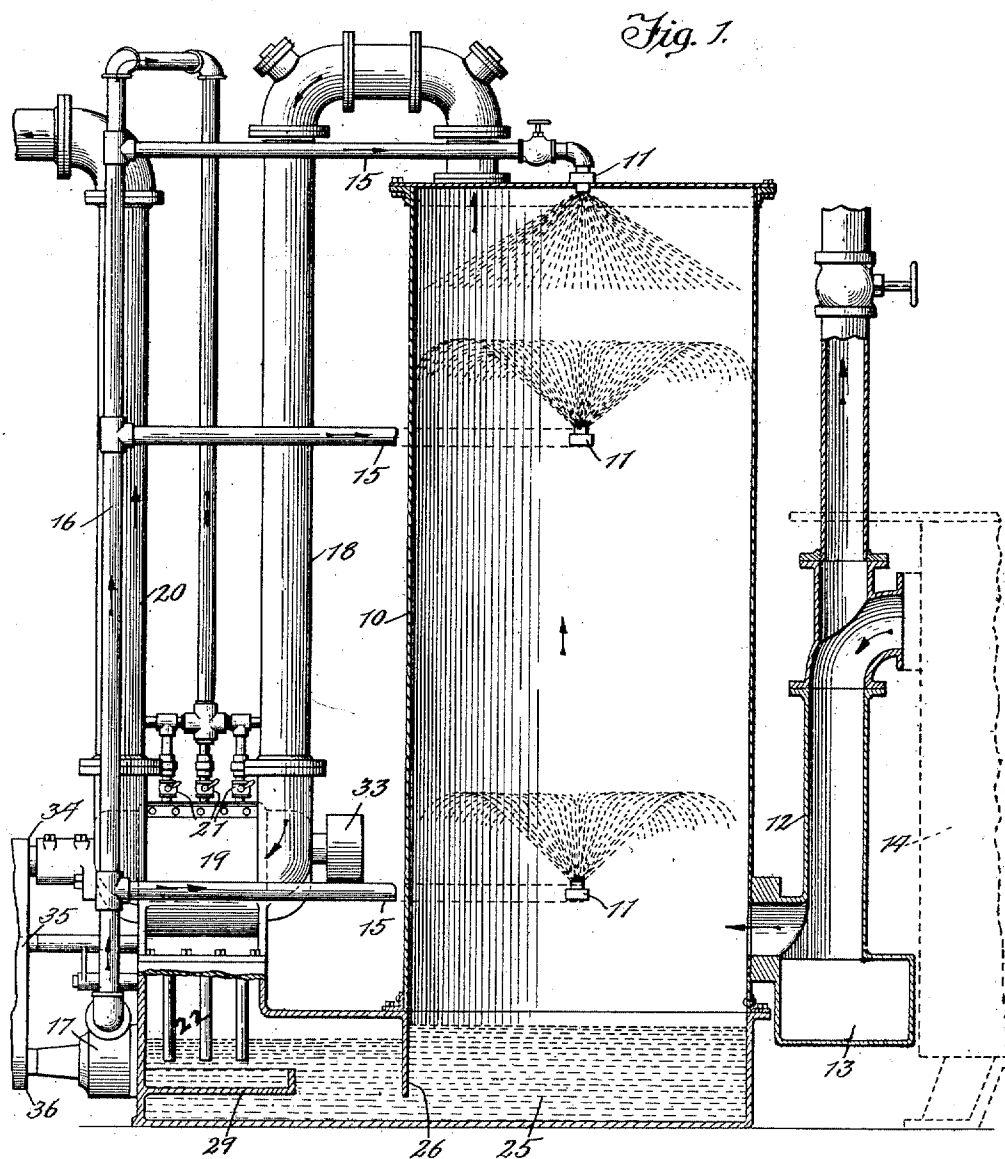


W. W. GORE & F. G. HOBART.
GAS CLEANING APPARATUS.
APPLICATION FILED MAY 8, 1909.

981,188.

Patented Jan. 10, 1911

3 SHEETS-SHEET 1.



Witnesses:
Ed. D. Perry
Wm. J. Smith

Inventors:
Warren W. Gore
Franklin G. Hobart
By Cheever & Cox
Attys.

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3 SHEETS—SHEET 2.

Fig. 2.

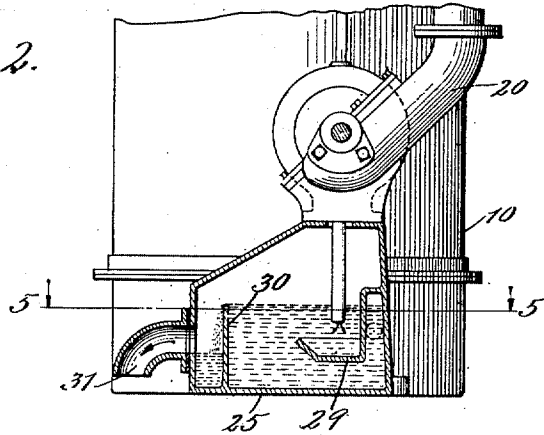


Fig. 3.

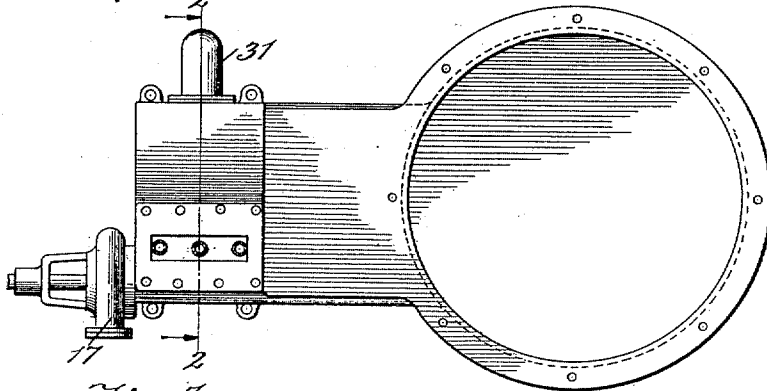
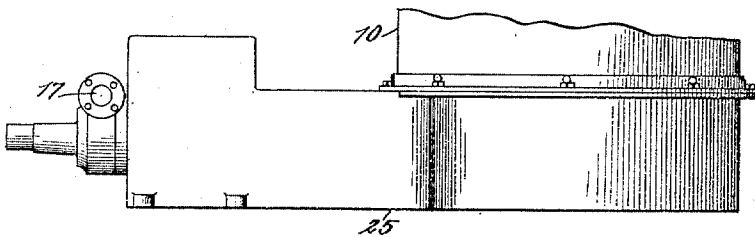


Fig. 4.



Witnesses:
D. P. Perry
Allen J. Lueder

Inventors:
Warren W. Gore
Franklin G. Hobart
By Cheever & Cox Attorneys

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3 SHEETS—SHEET 3.

Fig. 5.

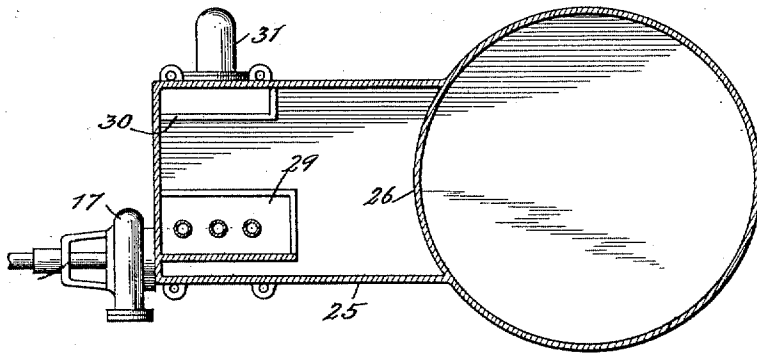


Fig. 7.

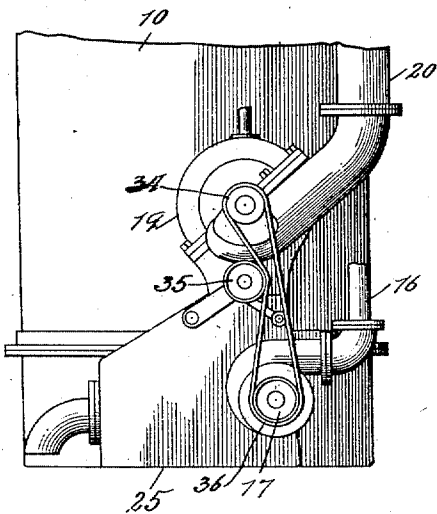
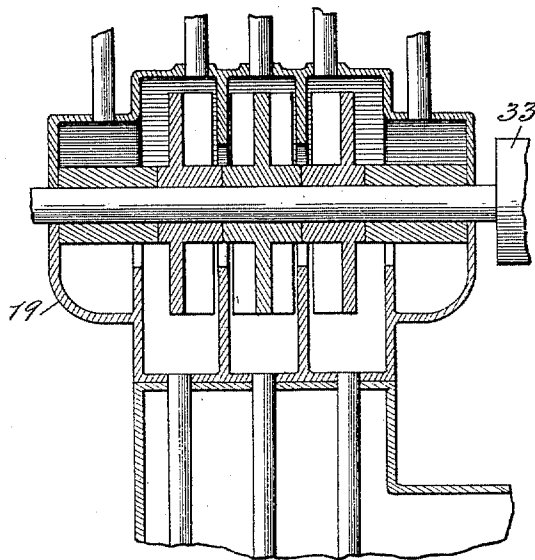


Fig. 6.



Witnesses:
H. D. Terry
C. J. Sander

Inventors:
Warren W. Gore
Franklin G. Hobart
By Cheever & Cox
Attys.

UNITED STATES PATENT OFFICE.

WARREN W. GORE, OF OLYMPIA, WASHINGTON, AND FRANKLIN G. HOBART, OF BELOIT, WISCONSIN, ASSIGNORS TO FAIRBANKS, MORSE & COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

GAS-CLEANING APPARATUS.

981,188.

Specification of Letters Patent.

Patented Jan. 10, 1911.

Application filed May 8, 1909. Serial No. 494,803.

To all whom it may concern:

Be it known that we, WARREN W. GORE and FRANKLIN G. HOBART, citizens of the United States, residing, respectively, at Olympia, in the county of Thurston and State of Washington, and Beloit, county of Rock, and State of Wisconsin, have invented certain new and useful Improvements in Gas-Cleaning Apparatus, of which the following is a specification.

Our invention relates to gas producers, more especially such portion of the apparatus as cools the gas and extracts the tar and other impurities therefrom before the gas passes to the engine or other apparatus where the gas is to be used.

The object of our invention is to provide efficient and economical apparatus for cooling and purifying the gas also to provide apparatus in which the regulation will be automatic. These objects are obtained as a result of certain characteristics of construction and arrangement which will be hereinafter more particularly described and claimed.

In the accompanying drawings which illustrate an apparatus embodying our invention, Figure 1 is an elevation of the entire apparatus, the cooler and some of the other parts being taken in central section. Fig. 2 is a vertical section taken on a plane indicated by the line 2—2 Fig. 3. Fig. 3 is a plan of the preferred form of machine upon which the cooler and tar extractor are mounted. Fig. 4 is a side elevation of the parts shown in Fig. 3. Fig. 5 is a plan section taken on the line 5—5 Fig. 2. Fig. 6 is a vertical sectional view of the preferred form of tar extractor employed. Fig. 7 is an elevation from the pump side of the apparatus.

Similar numerals refer to similar parts throughout the several views.

The cooler consists of a receptacle 10 provided with sprayers 11 and adapted to receive gas from a supply pipe 12 or other suitable duct. The form of duct is immaterial but it is desirable that it lead into cooler 10 near the bottom thereof and it should be provided with a dust chamber 13 at the bottom. This assists in removing solid impurities from the gas as it leaves the producer proper, indicated by the dotted lines

14 at Fig. 1. The sprayers 11 are supplied through suitable pipes 15 leading from a riser 16 forming the outlet of pump 17.

Leading from the cooler 10 preferably at the top thereof is a pipe 18 which conveys the cooler gas to the tar extractor 19. A pipe 20 conveys the cooled and purified gas from the extractor 19 to whatever apparatus is to be employed for using or storing the gas. The tar extractor is supplied with water from pipes 21 having communication with and being supplied from said riser 16. The water from pipes 21 together with the tar and other impurities that may be collected from the tar extractor are discharged through pipes 22 at the bottom of the tar extractor.

Although the precise construction of the tar extractor is not essential, the preferred construction is shown in Fig. 6, and is also described and claimed in United States Letters Patent No. 845,460, issued February 26, 1907, to Warren W. Gore.

The cooler and tar extractor are mounted upon a common base 25 which is hollow to hold the water dropping from said cooler and tar extractor and preferably is formed of a single casting. One advantage in this construction is that the entire purifying apparatus is self contained and there are no valves or piping necessary to convey the water and separated tar to said base, and therefore there is nothing that can become clogged up by the separated tar or other impurities.

A partition 26 extending downward to a point below the water level in the base forms a seal for preventing gas from escaping from the cooler 10 or air gaining access thereto. The discharge pipes of the tar extractor also extend to a point below the water level in said receptacle and thus seal the tar extractor against the admission of air or discharge of gas through the discharge pipes.

A pan or shield 29 is located beneath the mouths of the discharge pipes and prevents undue agitation of the water. This permits the pump 17 to obtain its supply at a point in the base where the water is quiet and hence practically free from impurities.

The height or level of the water in the base 25 depends upon the height of the spill-

way 30 shown in Fig. 2. After the water has flowed over the spillway it is discharged through a waste pipe 31.

The centrifugal pump 19 is driven by a band wheel 33 or other power mechanism and said tar extractor is in turn provided with a band wheel 34 driving a band 35 which drives the band wheel 36 of the pump 17.

In operation, the gas from the producer is introduced into the cooling chamber 10 through the duct 12, and as the gas passes up it is cooled by the water from the sprays 11. The gas in passing out through the duct 18 enters the tar extractor 19 where the tar is removed by the action of the water entering through the pipes 21 and the mechanical action of said extractor. The water, dropping from the sprays in the cooler and tar extractor, is collected in the base 25 from which it is pumped back to said sprays. The water may thus be used over and over again, which is a feature of great importance where water is scarce. The tar removed by the extractor and discharged through the pipes 22 floats to the surface of the water in the base and flows over the spillway or dam 30 and is hence carried from the apparatus. The impurities are thus removed and the water is purified sufficiently to admit of re-use.

The water will not ordinarily stand at the same level throughout the base, the level being higher or lower beneath the cooler, depending upon whether pressure of the gas in the cooler is above or below atmospheric pressure.

As the pump and extractor are belted together they will always rotate at the same relative speed and hence the speed of the extractor may be increased or decreased to ob-

tain the best results without fear of either an excessive or insufficient supply of water from the pump.

The proportion of water flowing into the extractor is regulated by valves located in the pipes 21 as shown. The amount of water flowing away from the apparatus as a result of the skimming process at the spillway 30 is compensated for by introducing fresh water into the apparatus at any suitable point.

What we claim as new and desire to secure by Letters Patent, is:

In an apparatus for purifying gas, a tar extractor, means for introducing water thereinto, a hollow base adapted to receive the water flowing from said extractor, said base extending laterally from beneath the tar extractor and being provided with a depending partition between the part beneath the extractor and the extension, said partition having its lower edge in spaced relation to the bottom of the hollow base, whereby the partition forms a skimmer during normal working conditions, and a circulating pump having its suction end communicating with the extension of the base above the lower edge of said partition and its delivery end communicating with said water introducing means.

WARREN W. GORE.
FRANKLIN G. HOBART.

Witnesses to the signature of Warren W. Gore:

REINHOLD H. LUEPKE,
GEORGE F. YANTIS.

Witnesses to the signature of Franklin G. Hobart:

GEO. B. INGERSOLL,
H. E. SMETTS.