

(No Model.)

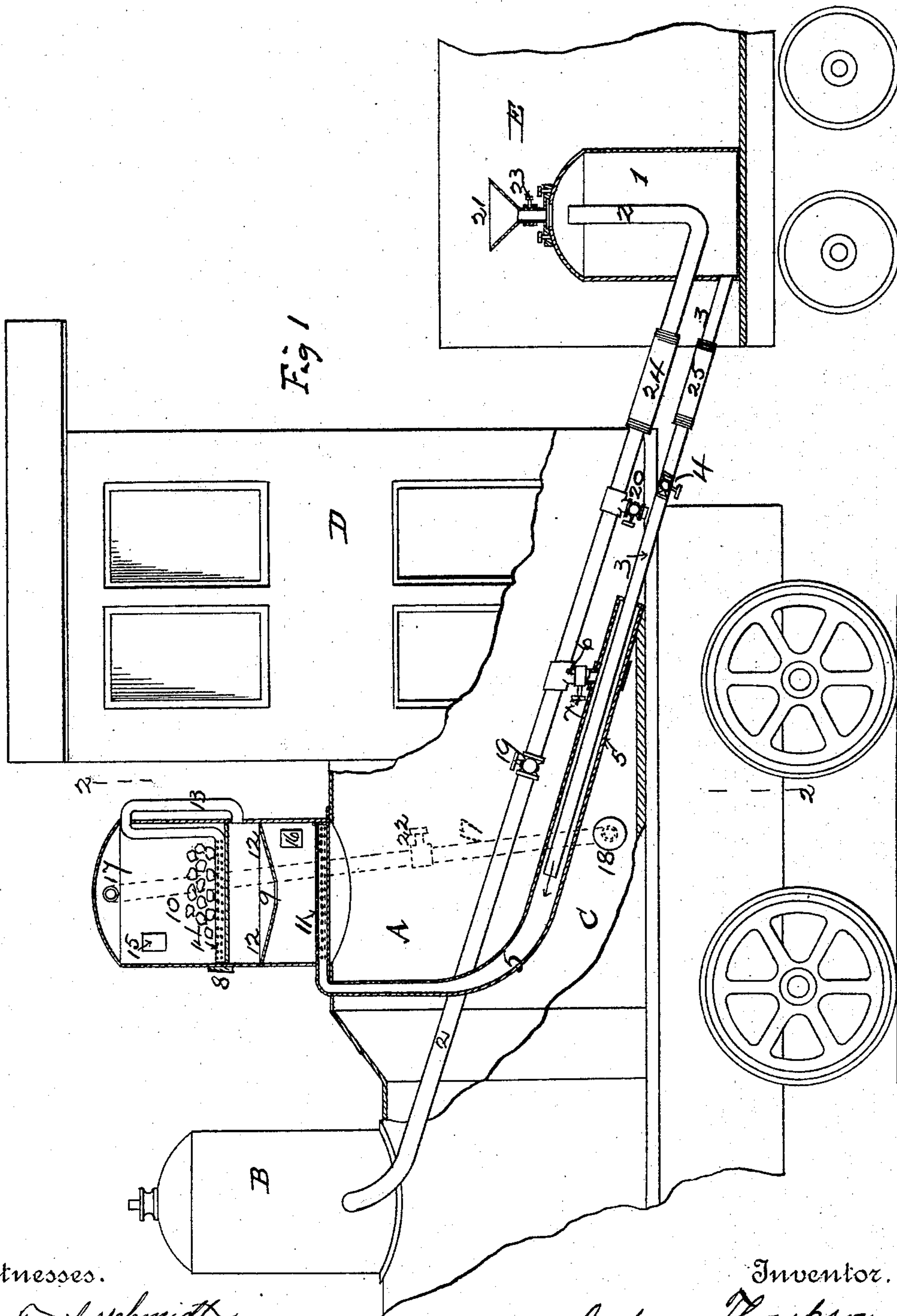
2 Sheets—Sheet 1.

A. THOMPSON.

APPARATUS FOR THE MANUFACTURE OF GASEOUS FUEL.

No. 388,465.

Patented Aug. 28, 1888.



Witnesses.

G. A. Tauberschmidt.
Chas J. Gooch.

Inventor.

Andrew Thompson.
By his Attorney F. W. Rutter.

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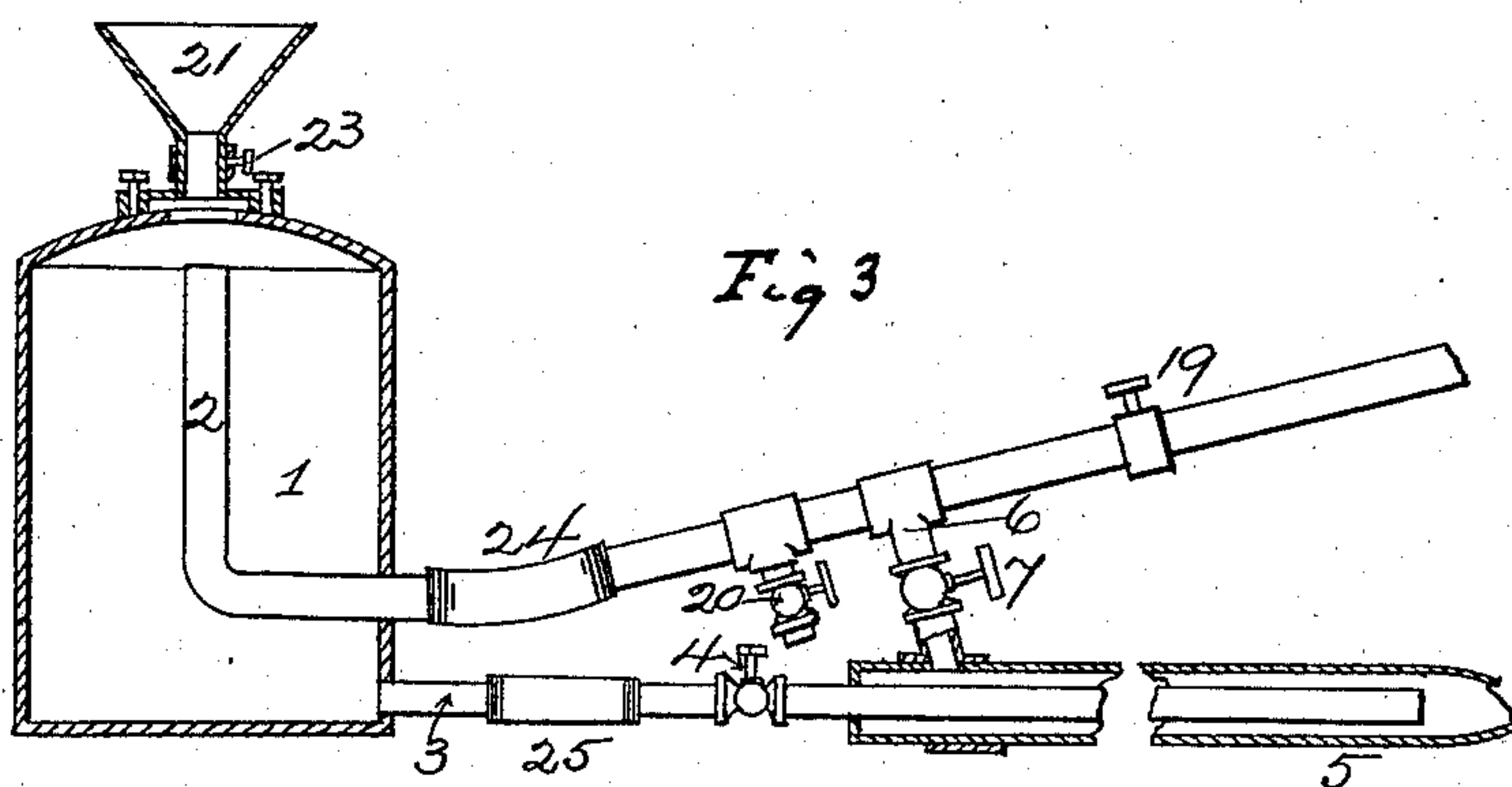
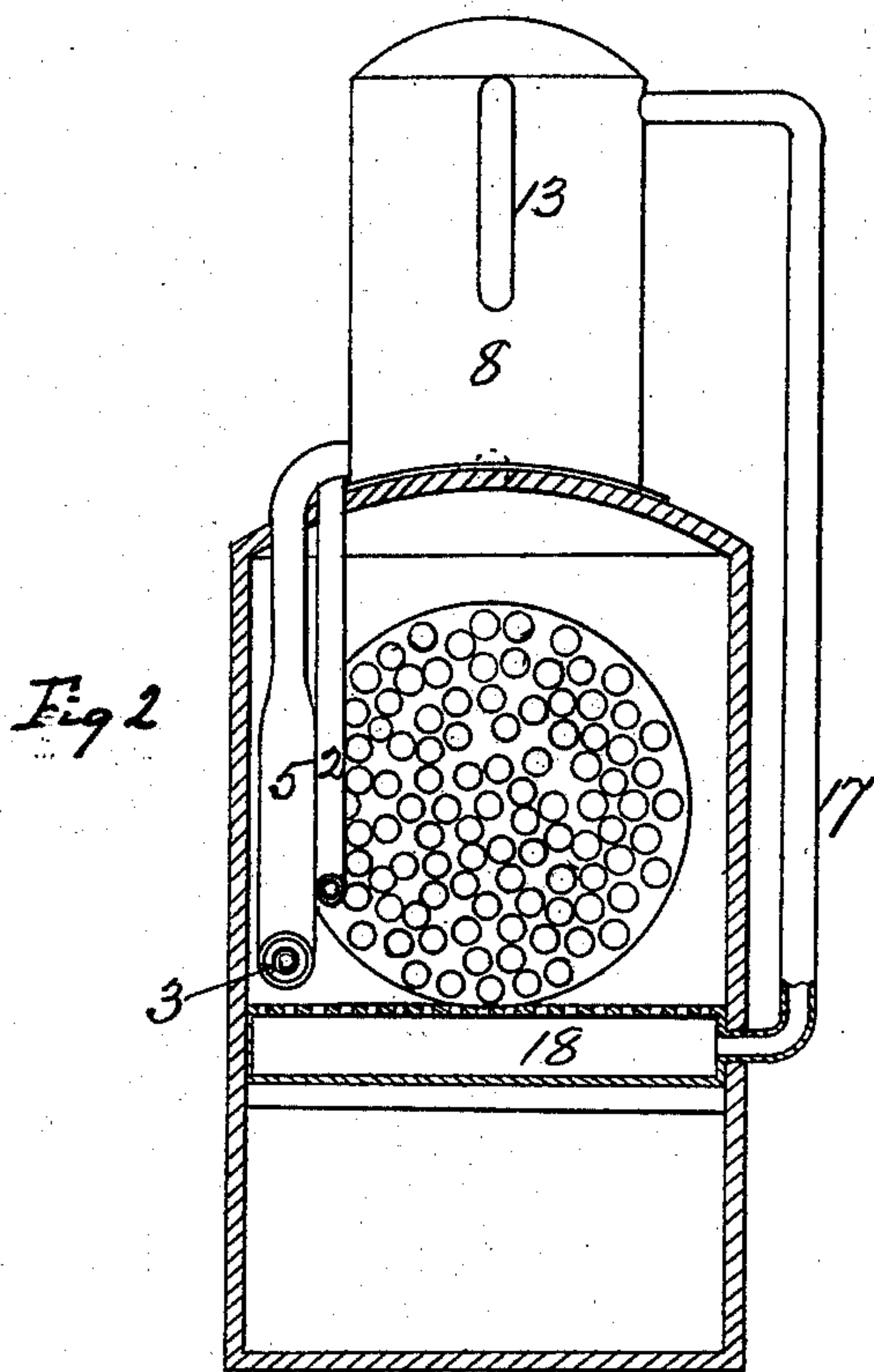
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UNITED STATES PATENT OFFICE.

ANDREW THOMPSON, OF PITTSBURG, PENNSYLVANIA, ASSIGNOR OF TWO-THIRDS TO JOHN T. MOORE, OF SAME PLACE.

APPARATUS FOR THE MANUFACTURE OF GASEOUS FUEL.

SPECIFICATION forming part of Letters Patent No. 388,465, dated August 28, 1888.

Application filed April 6, 1887. Serial No. 233,825. (No model.)

To all whom it may concern:

Be it known that I, ANDREW THOMPSON, a citizen of the United States, residing at Pittsburg, in the county of Allegheny, State of Pennsylvania, have invented certain new and useful Improvements in Apparatus for the Manufacture of Hydrocarbon Vapors and Gas for Fuel, Heating, Lighting, &c.; and I hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, wherein the devices are shown as attached to a locomotive for the purpose of generating a gaseous fuel from hydrocarbon.

This apparatus has in the main been devised for use with moving structures—such as locomotives, steamboats, &c.—but is generally useful for manufacturing hydrocarbon vapors and gas, either for heating or lighting purposes, and especially is it valuable about manufactories where furnaces and steam-generators are commonly employed.

The main elements of the apparatus are a source of steam-supply, (or a source of air under pressure,) an oil-reservoir from which the hydrocarbon is fed by the steam-pressure, (or air-pressure, if the same can be readily obtained,) a superheater for superheating the steam and oil, (or air and oil,) and a carbureting-chamber into which the superheated steam (or air) and oil are delivered and wherein the vapors and gas are developed. The position and arrangement of these several devices will of course be such as their particular location and application require and the good judgment of the constructor determines. In the present instance I have shown them as applied to a locomotive, and will now proceed to specifically describe them, so that others skilled in the art may apply the invention and modify it as circumstances require.

In the accompanying drawings, Figure 1 represents a sectional side elevation of a portion of a locomotive and tender with my improvements applied thereto. Fig. 2 represents a section taken on the line 2 2 of Fig. 1. Fig. 3 represents on a larger scale a detail sectional view of the oil-reservoir and the steam or air supply and fluid or vapor discharge pipes connected therewith.

In the drawings, A indicates the rear part of a locomotive; B, the steam-drum; C, the fire box; D, the cab, and E the tender.

1 indicates an oil-reservoir, which in the present instance is shown as located on the tender E, (in which case flexible connections 24 25, as hereinafter referred to, will have to be used;) but said reservoir 1 may be placed in the cab D, if there is room enough for it.

2 indicates a steam supply and pressure pipe leading from the steam-drum B, preferably entering the lower part of reservoir 1 and delivering into its upper part, to cause a downward feed-pressure on the oil in tank 1.

19 is a valve for controlling the pressure on the oil in the reservoir.

Leading from the bottom of the oil reservoir 1 is a feed or service pipe, 3, for delivering the oil to the carbureting-chamber 8. This chamber 8 is divided into a first or lower chamber, 9, which serves, first, for the deposit of condensible matter, and, second, to retain the condensed matter and utilize the vaporizable portion thereof to carburet the passing fixed gases, and a second or purifying chamber, 10, for the reception of lime or equivalent purifying agent. Thus, while it possesses all the functions of an ordinary carbureting-chamber, it also possesses other material functions not incident to the ordinary carbureting-chambers. The carbureting chamber may be placed on the locomotive back of the steam-drum B or in any other suitable place. The pipe 3 is provided with a valve, 4, by which the flow of oil can be regulated or entirely cut off at will. The pipe 3 preferably terminates before it reaches the carburetor 8, and is incased by a steam-pipe, 5, which latter extends to and delivers into the carburetor 8. By terminating the oil-pipe 3 within the incasing-pipe 5 the effect of an ejector is obtained and thereby two feed-forces are exerted on the oil in the reservoir, viz: first, the pressure on the surface of the oil in oil-reservoir 1, and second the ejector action of pipes 3 and 5. The steam-pipe 5 is connected by a branch, 6, with the steam-supply pipe 2, and a valve, 7, controls the amount or volume of steam passing through branch 6 into incasing-pipe 5, and thence with oil to the carburetor 8. The incas-

ing steam-pipe 5 and its centrally-arranged oil-delivering pipe 3 are preferably arranged in the fire-box or in the side walls of the fire-box of the furnace, so as to form a superheater to superheat the steam and highly heat or vaporize the oil on their way to carburetor 8.

8 indicates the carburetor, preferably divided into chambers 9 and 10.

The pipe 5 delivers the steam, oil, and vapor through perforations (or a perforated diaphragm) 11 into the lower chamber, 9, of the carburetor, in which chamber any condensible matter will be retained, and in which oil may be kept, if found desirable.

12 indicates a flange extending inwardly from the walls of chamber 9, which will be found useful on moving structures (such as locomotives and steamboats) to prevent the rolling or wash of the oil in chamber 9. Instead of flange 12, an ordinary float may be used, if desired.

The lower chamber, 9, of the carburetor is connected with the upper chamber, 10, by a pipe or conduit, 13, through which the vapors and gas pass, said conduit dipping down and terminating on the bottom of the chamber either in a perforated coil or under a perforated diaphragm, as shown at 14. In this upper chamber, 10, is or may be placed lime or any other purifying agent, many of which are well known to gas-manufacturers. In the sides of the carburetor 8 may be placed man-holes 15 and 16, through which access may be had to the chambers 9 and 10 of the carburetor. From the upper chamber, 10, a pipe, 17, conveys the vapor and gas to a burner, 18, arranged in the fire-box, or to any other place where it is desired to use it for either heating or lighting purposes, the supply of gas through said pipe being regulated by a valve, 22.

20 represents a valved coupling connected to the pipe 2, by means of which said pipe may be connected with the air-pump or compressed-air reservoir and compressed air used in lieu of steam for admixture with the oil.

21 represents a funnel-shaped oil-supply spigot attached to the oil-reservoir 1, through which oil may be supplied thereto, said supply-funnel being provided with a stop-cock, 23, to regulate the supply of oil to the reservoir 1.

24 represents an elastic tubular connection or coupling between the sections of the pipe 2 carried, respectively, by the locomotive and the tender; and 25 represents a similar elastic coupling between the respective sections of the pipe 3.

The operation of the devices will be as fol-

lows: The reservoir 1 having been filled with oil, the valve 19 of steam-pipe 2 is opened to produce pressure on the oil in reservoir 1, the valve 4 of oil-pipe 3 is opened and the oil is forced through pipe 3 toward the carburetor 8. At the same time valve 7 of branch pipe 6 is opened and the steam rushes into incasing-pipe 5, (or superheater,) takes up and vaporizes the oil from pipe 3, carrying it with the steam into carburetor 8, where the gas is purified, and whence it passes to the point of consumption, as hereinbefore specified.

In the case of trains or other places where air under pressure can be had, or, if air under pressure is preferred for any reason, the pipe 2 can be connected with reservoir of compressed air and compressed air substituted for steam. The operation will be substantially the same, and the foregoing specification will be an accurate description thereof if the word "air" is substituted for "steam" wherever that word occurs.

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

1. In apparatus for the manufacture of a gaseous fuel and illuminant, the combination of an oil-reservoir, a steam-pipe leading thereto and delivering thereinto above the oil-level, an oil-feed pipe leading therefrom, an incasing superheater-pipe into which the oil-feed pipe delivers, a branch pipe which connects the steam-pipe and the pipe which incases the oil-feed pipe, and suitable valves for controlling the several pipes, substantially as and for the purposes specified.

2. In apparatus for the manufacture of gaseous fuel and illuminants, the combination of an oil-reservoir, a steam-pipe leading thereto and delivering thereinto above the oil-level, an oil-feed pipe leading therefrom, a superheater-pipe which incases the oil-feed pipe and into which the feed-pipe delivers, said latter pipe delivering into a carbureting-chamber, a carburetor having a lower deposit and an upper purifying-chamber, a branch pipe which connects the pipe that incloses the oil-feed pipe with the main steam-pipe, and suitable valves for controlling the several pipes, substantially as and for the purposes specified.

In testimony whereof I affix my signature, in presence of two witnesses, this 4th day of April, 1887.

ANDREW THOMPSON.

Witnesses:

JOHN T. MOORE,
C. E. SUCCOR.