

No. 750,311.

PATENTED JAN. 26, 1904.

W. L. SEVERANCE.
CARBURETER.

APPLICATION FILED MAR. 18, 1903.

NO MODEL.

2 SHEETS—SHEET 1.

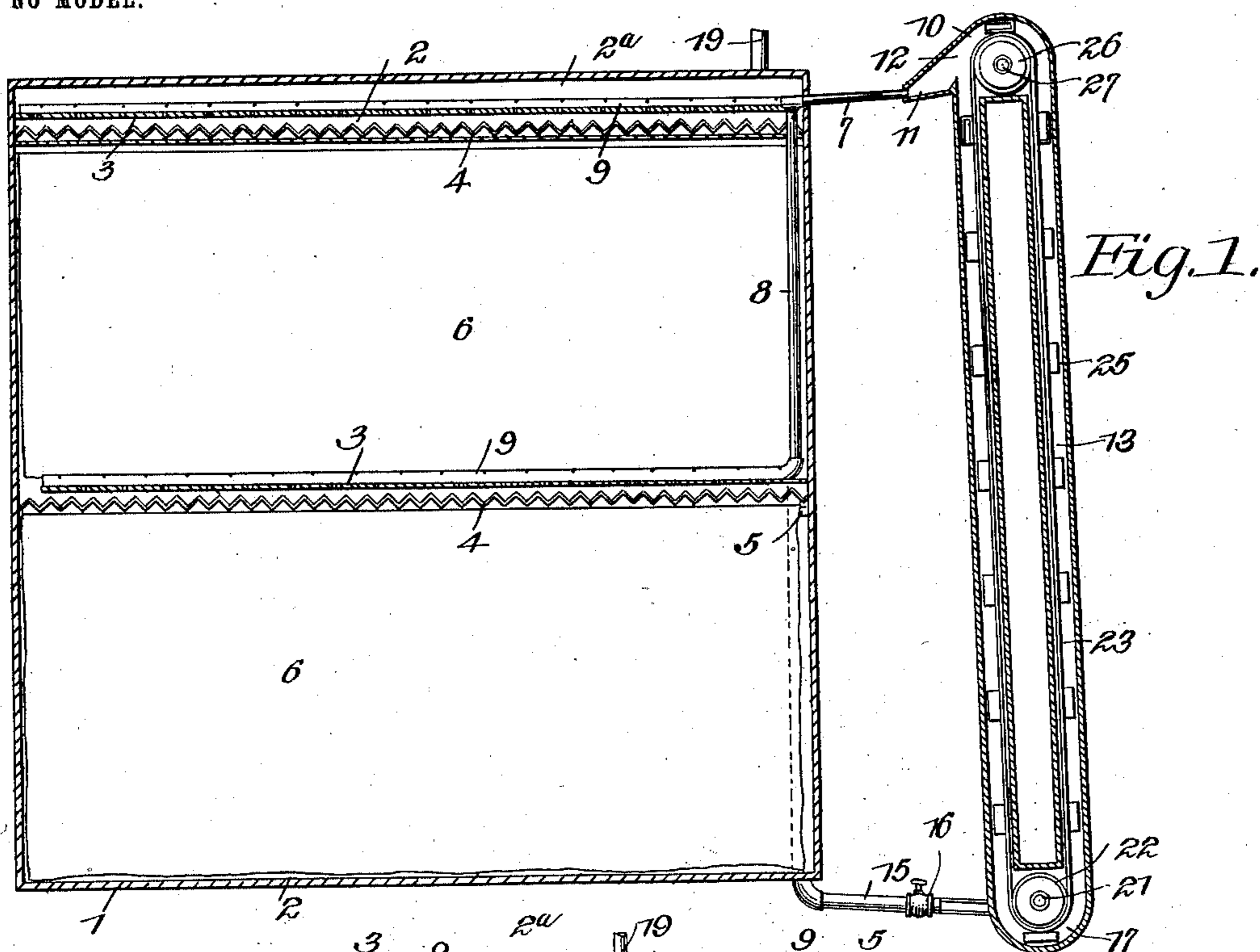
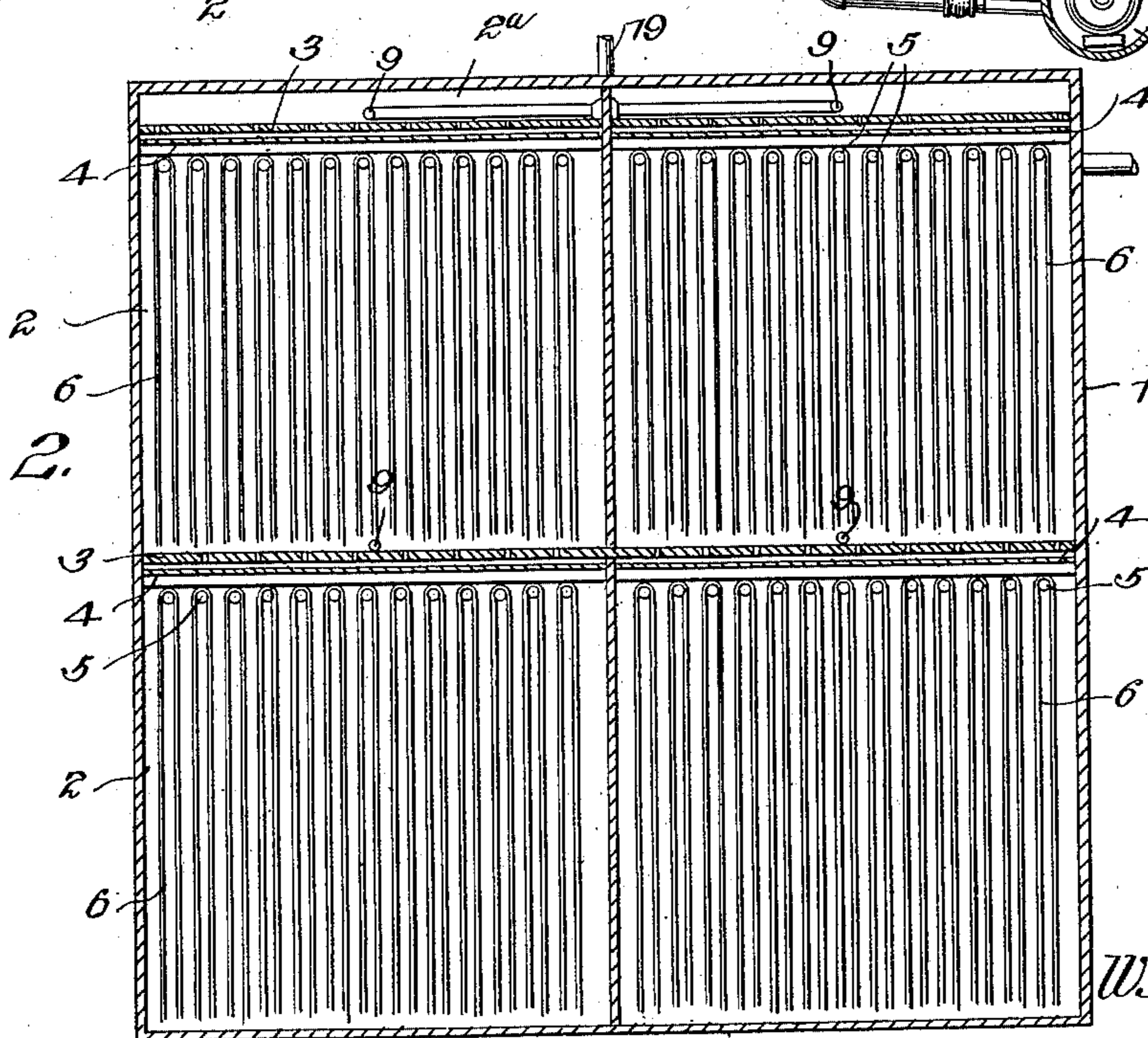


Fig. 2.



Witnesses
E. J. Stewart
Dexter Morton

by

Chas. H. Snow & Co.
Attorneys

W. L. Severance,
Inventor.

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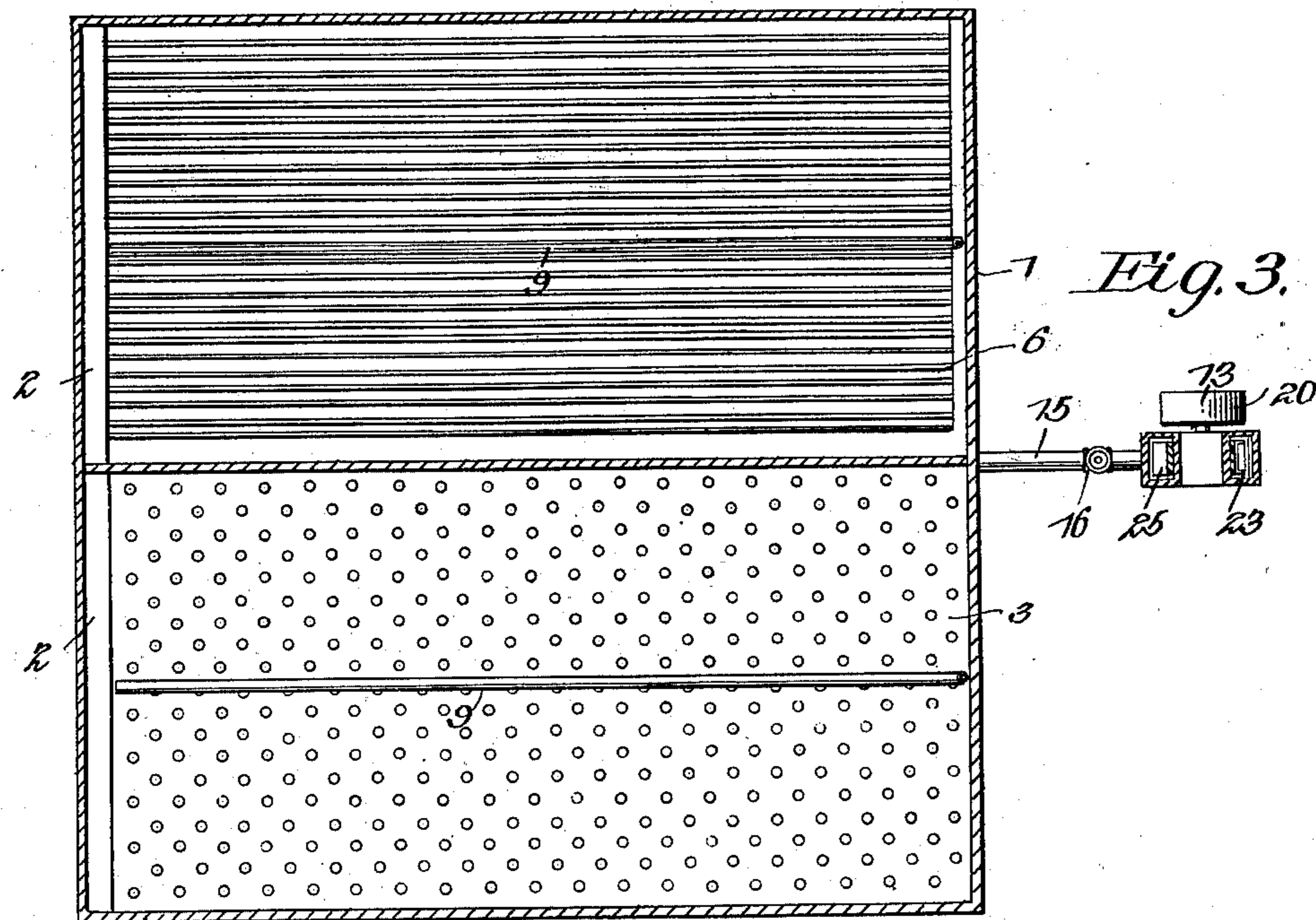
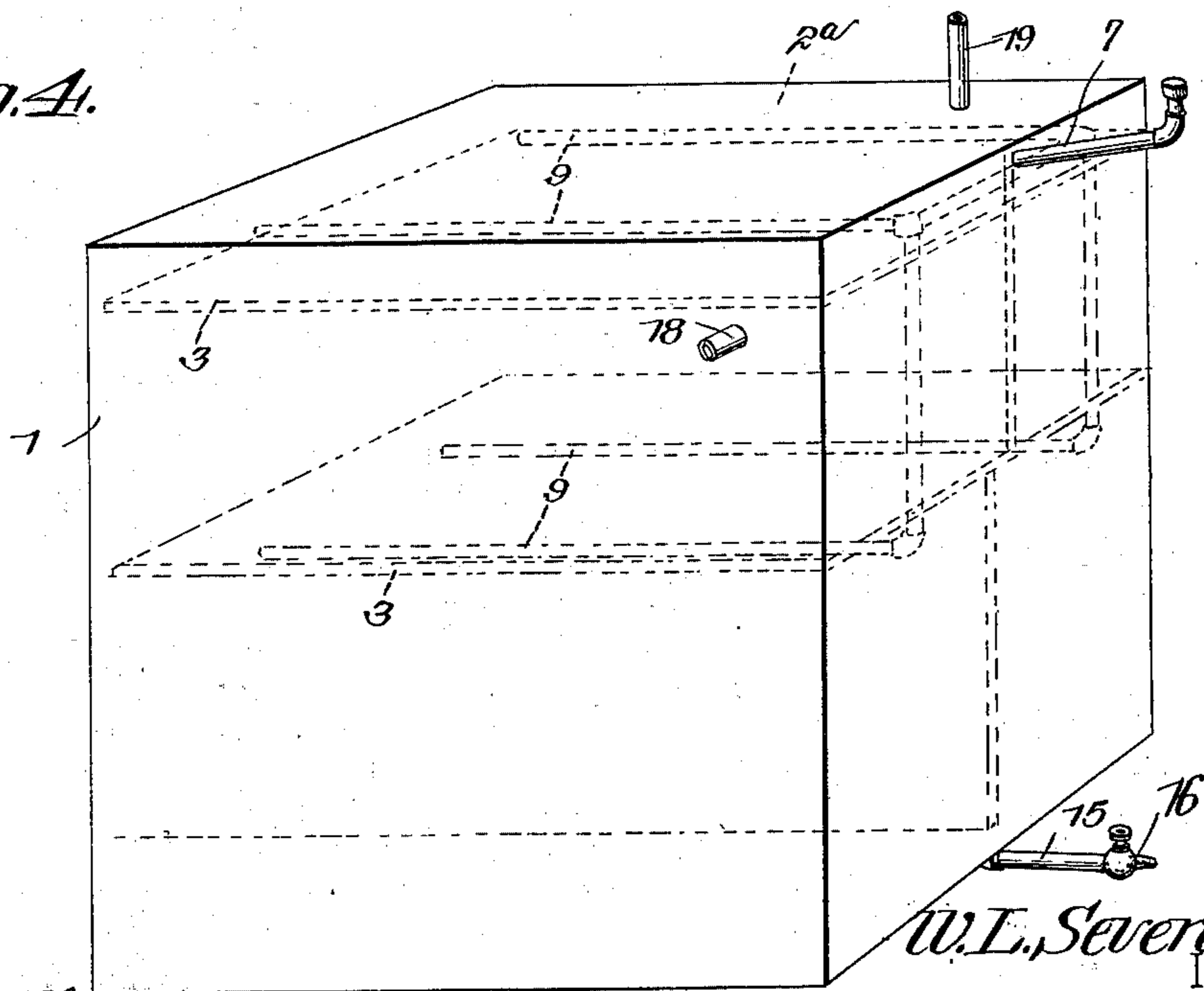


Fig. 4.



Witnesses
E. H. Stewart
Dexter Morton

by

W. L. Severance
Inventor:
C. A. Snow & Co.
Attorneys

UNITED STATES PATENT OFFICE.

WALLACE L. SEVERANCE, OF FREEPORT, ILLINOIS.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 750,311, dated January 26, 1904.

Application filed March 18, 1903. Serial No. 148,422. (No model.)

To all whom it may concern:

Be it known that I, WALLACE L. SEVERANCE, a citizen of the United States, residing at Freeport, in the county of Stephenson and State of Illinois, have invented a new and useful Carbureter, of which the following is a specification.

My invention relates to carbureters, and more particularly to that type of carbureters in which a hydrocarbon of suitable density is distributed over the surface of a number of sheets of absorbent material from which it is taken up by air which is forced through the apparatus and caused to pass over the sheets saturated with the hydrocarbon.

The principal objects of the invention are to produce a carbureter of simple construction in which no considerable quantity of hydrocarbon liquid is ever allowed to stand, thereby preventing the deposit of sediment in the carbureter; to make the gases produced by the carbureter uniform in quality at all times, thus obviating the need of a separate air-mixer; to reduce to a minimum the quantity of hydrocarbon liquid necessary for the operation of the apparatus; to make an apparatus which will yield gas of uniform quality from different grades of hydrocarbons, and to improve generally the construction of devices of the class described.

In attaining the objects above stated I make use of the construction and combination of parts of a carbureter hereinafter described, and shown in the accompanying drawings, in which corresponding parts are indicated by the same characters of reference throughout the different views.

In the drawings, Figure 1 is a vertical section through the carbureter and elevator in a plane parallel to the vertical partition. Fig. 2 is a vertical section in a plane transverse to the vertical partition. Fig. 3 is a horizontal section showing in one side one of the perforated horizontal partitions and in the other the arrangement of the absorbent curtains over which the hydrocarbon is distributed. Fig. 4 is a perspective view of the carbureter with the elevator detached and with the horizontal partitions and pipes for distributing the hydrocarbon fluid indicated in dotted lines.

Broadly stated, the invention consists of an apparatus containing a series of chambers through which air is caused to pass successively, each chamber being provided with vertically-disposed curtains, of cloth or other suitable absorbent material, over which the hydrocarbon is distributed by feeding devices at the top of each chamber, and means for supplying the hydrocarbon to said chambers and curtains and withdrawing from the bottom of the apparatus any excess of hydrocarbon not absorbed by the absorbent curtains.

The apparatus hereinafter described and shown in the accompanying drawings is of suitable size and capacity for supplying, when producing a maximum quantity of gas, twenty-five gas-burners and a gas-range of the average size for private houses; but it is obvious that the invention may be applied to carbureters of larger or smaller capacity by merely increasing or decreasing the size of the apparatus and the number of carbureting-chambers therein.

Referring to the drawings by reference characters, 1 designates the outer casing of the carbureter, which is a rectangular parallelepipedon, as shown in the drawings, of almost cubical form, but which may be of any preferred contour.

2 2 are carbureting-chambers separated by perforated horizontal partitions 3 3 from each other and from the shallow gas-chamber 2^a at the top of the carbureter.

4 4 4, &c., are sheets of felt disposed just below the perforated plates 3 3 and preferably having small folds or plaits, as shown, though they may be flat, if desired. Immediately below the sheets of felt 4 are wires 5, disposed longitudinally of each carbureting-chamber and suitably fastened at the ends to the other casing 1, as by soldering. On each of the wires 5 is suspended a centrally-folded curtain, of cloth, of any suitable texture, which is adapted to absorb any hydrocarbon of suitable density for making illuminating-gas by mixing with its vapor a proper proportion of air. These cloth curtains, which are designated by the numeral 6, extend down from the wires almost to the bottom of each carbureting-chamber, leaving a little space below them

for the distribution of hydrocarbon over the bottom of the chamber for the purpose which will be hereinafter explained.

7 designates a supply-pipe having branches 8 8 terminating in perforated portions 9 9 over the perforated partitions 2 2, as shown in the drawings. The supply-pipe 7 may be closed with any suitable closure, as a screw-cap, (not shown,) but in the preferred form it will be connected with a chamber 10 through an outlet-pipe 11 with a funnel-shaped upper extremity 12, into which hydrocarbon liquid is discharged from an elevator 13, hereinafter more fully described.

At the bottom of the carbureter is provided an outlet-pipe 15, which has a valve 16 of any suitable construction. The outlet-pipe 15 in the preferred form of the invention communicates with a chamber 17, located below the level of the bottom of the carbureter, which serves as a reservoir for the hydrocarbon liquid and in which is mounted the lower portion of the elevator 13, above mentioned.

At 18 is provided an inlet for the air, which is forced through the carbureter by any suitable form of apparatus for that purpose, and at 19 is provided a gas-eduction pipe from which gas is distributed through the various burners.

It will be observed that at one end the perforated plates 3 3 between the upper and lower carbureting-chambers extend completely to the end of the carbureter, while at the other end a space is left between the ends of the perforated plates and the casing-wall of the carbureter, and at the end of the carbureter opposite that at which said space is provided the vertical partition between the two lower carbureting-chambers does not extend completely to the casing-wall. In this way air-passages are left from chamber to chamber, and the air which enters at 18 passes through the chamber into which the inlet opens downward into the chamber below, thence into the adjacent chamber by passing around the end of the vertical partition, and finally into the upper chamber adjacent that first entered, whence it escapes through the gas-eduction pipe 19 as gas.

The elevator 13 is of the ordinary chain-and-bucket type inclosed in a suitable casing, as shown, to prevent the escape of the hydrocarbon by evaporation and is driven by a pulley 20, mounted on the lower shaft 21, on which is mounted one of the wheels 22, over which the chain 23, with the bucket 25 mounted thereon, travels. The upper wheel 26 is mounted on a short shaft 27, journaled in the side walls of the chamber 10. The pulley 20 is to be connected by a belt with a pulley of the same diameter provided on the shaft of the blower or other apparatus for forcing air through the carbureter, the object of this driving mechanism being to insure a speed in the elevator which shall at all times be proportionate to that of

the air-forcing apparatus, thus making the amount of hydrocarbon carried up by the elevator and discharged through the supply-pipe into the carbureter proportional to the quantity of air forced through the carbureter by the blower or other forcing apparatus. (Not shown.)

The operation of the invention in preferred form is as follows: A hydrocarbon liquid of any suitable density—such as gasolene, naphtha, benzol, or the like—is poured into the chamber 17, one gallon being sufficient for the apparatus hereinbefore described, and, if desired, to make the apparatus operate immediately an additional quantity of hydrocarbon may be poured into the funnel-shaped upper portion 12 at the end of the pipe 11, which connects with the supply-pipe 7. This additional supply will be at once distributed through the branches 8 and 9 of the supply-pipe to the perforated plates 3, over which it will spread and pass downward through the perforations therein, so saturating the sheets of felt 4 and the vertical curtains 6. The air-forcing apparatus is set in motion and air is caused to pass through the carbureter-chambers in the order previously explained, thus bringing the air into contact with a large surface of cloth saturated with the hydrocarbon, and so causing thorough admixture of hydrocarbon vapor with the air passing through the apparatus. If no hydrocarbon is poured directly into the supply-pipe 7, as above described, some time will be required for the elevator 13, which is set in operation simultaneously with the air-forcing apparatus, to discharge a sufficient quantity of hydrocarbon through the supply-pipe to saturate all the absorbent material, and gas will not be produced at once; but if the absorbent material is saturated before the air is forced through the apparatus the production of gas will be practically instantaneous, and only a few moments will elapse before a gas sufficiently rich for illuminating purposes or fuel will be obtainable at the eduction-pipe 19.

If the additional expense of the elevator 13 is objectionable, the apparatus may be operated by supplying hydrocarbon at suitable intervals through the supply-pipe 7, which then has its end closed by any suitable form of closure instead of being connected with the pipe 11, extending from the chamber 10, and the outlet-pipe 15 will then discharge into the air instead of into the chamber 17, and the valve 16 will be useful to detect the presence of any accumulation of hydrocarbon in the bottom of the carbureter. It will of course be understood that with the elevator 13 attached and the hydrocarbon supply pipe and outlet pipe connecting therewith the valve may be omitted, as there will be no need therefor, the action at the hydrocarbon supply and outlet apparatus being automatic.

After the carbureter has been supplied with

hydrocarbon and air forced through it until the pipes supplied by it have been filled with gas the supply of gas may be made continuous as long as a sufficient quantity of hydrocarbon is contained in the chamber 17 and the action of the carbureter and air-forcing apparatus will automatically adjust itself to the demand for gas, for when the gas-education pipe 19 is closed, so that no gas can escape through it, the air-forcing apparatus will be stopped and no air can pass through the carbureter; but as soon as the pipe 19 is opened to permit the passage of gas there-through air will be forced through the carbureter in the usual manner and the quantity of air forced through will depend upon the freedom with which gas passes through the pipe 19.

A special advantage of the construction described which has not hereinbefore been pointed out is that as all the hydrocarbon for vaporization is distributed over the said absorbent material in the carbureter and none is allowed to stand upon the bottom of the apparatus or in pans therein the maximum amount of vaporization from a given quantity of hydrocarbon in a given time is obtained, and consequently it is unnecessary to have at any time in the apparatus more than a small amount of the hydrocarbon. This feature is of importance, because it diminishes the probability of explosions to a minimum, making it safe to keep the apparatus in the basement or cellar of a house, thus protecting it and prolonging the usefulness of the apparatus.

Having thus described the construction and operation of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A carbureter having superposed chambers separated by perforated horizontal partitions, absorbent material suspended under said partitions, and an inlet-pipe for the hydrocarbon liquid at the top of the uppermost

chamber, and passages connecting said chambers so arranged that air may pass through all of the chambers successively. 45

2. A carbureter having superposed chambers separated by perforated horizontal partitions, absorbent material suspended under said partitions, a hydrocarbon-inlet pipe at the top of the uppermost chamber, an outlet-pipe at the bottom of the lowermost chamber, and passages connecting the chambers so arranged that air may be passed through all of the chambers successively. 55

3. A carbureter having a plurality of carbureting-chambers, vertically-disposed curtains of absorbent material suspended in said chambers, a perforated distributor-plate disposed above said curtains, and a hydrocarbon-supply pipe provided with perforations at intervals throughout its length extending over said distributor-plate. 60

4. A carbureter having a plurality of carbureting-chambers arranged in superposed tiers, perforated distributor-plates over each tier of chambers, a hydrocarbon-supply pipe at the top of the carbureter having perforated branches disposed over each distributor-plate, and vertically-disposed absorbent curtains in each chamber below the distributor-plates. 70

5. A carbureter having a carbureting-chamber provided at its top with a perforated distributor-plate, a layer of absorbent material beneath said plate and substantially parallel therewith, and vertically-disposed absorbent curtains suspended beneath said layer of absorbent material. 75

In testimony that I claim the foregoing as my own I have hereto affixed my signature in the presence of two witnesses. 80

WALLACE L. SEVERANCE.

Witnesses:

D. C. L. MEASE,
G. A. WEAVER.