

No. 692,255.

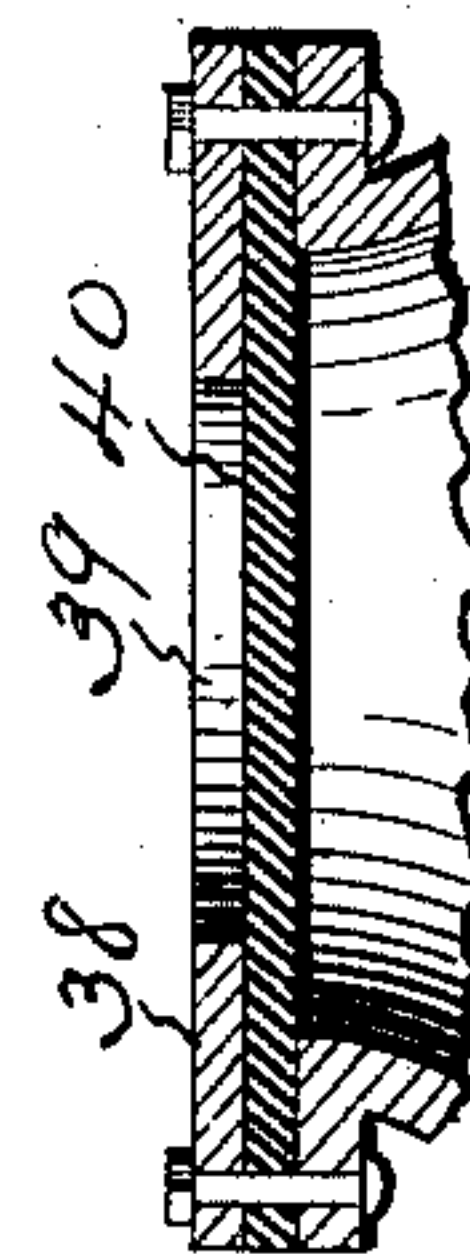
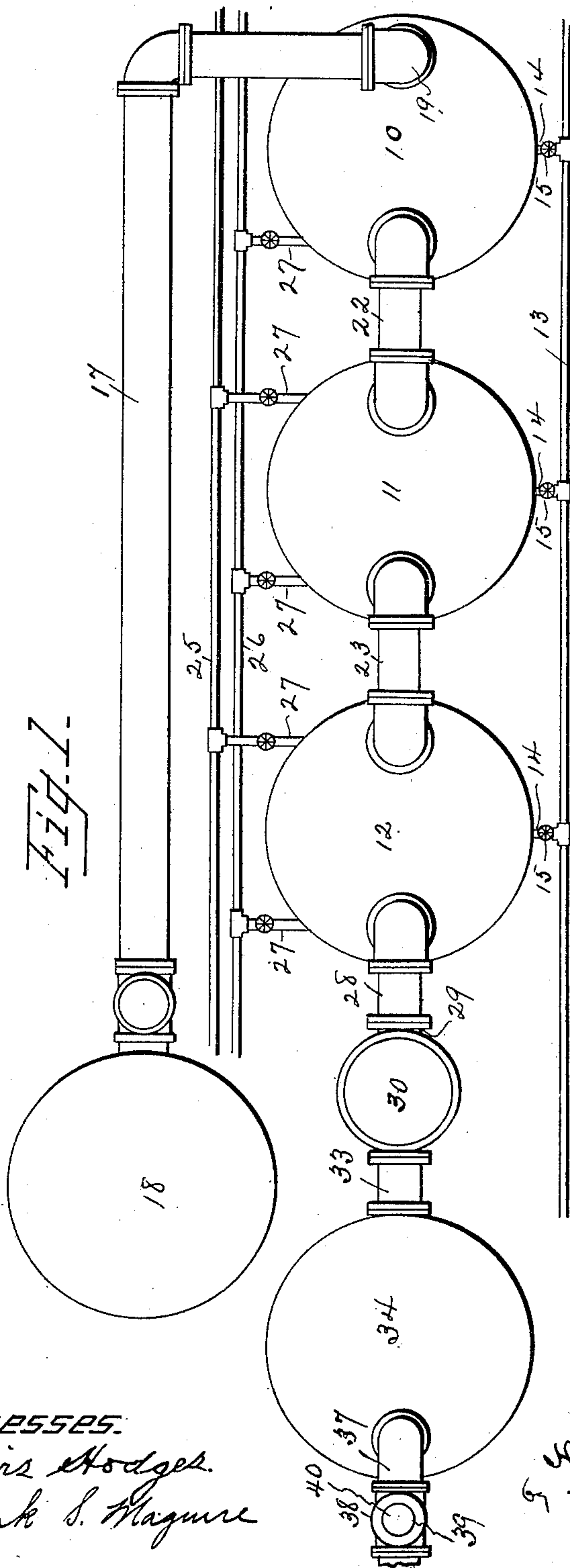
Patented Feb. 4, 1902.

H. J. DOOLAN.
CARBURETER.

(Application filed Apr. 26, 1901.)

(No Model.)

2 Sheets—Sheet 1.



Witnesses:
Lewis Hodges.
Frank S. Maguire

Inventor:
Henry J. Doolan
by Lewis S. Hodges
Atty.

No. 602,255.

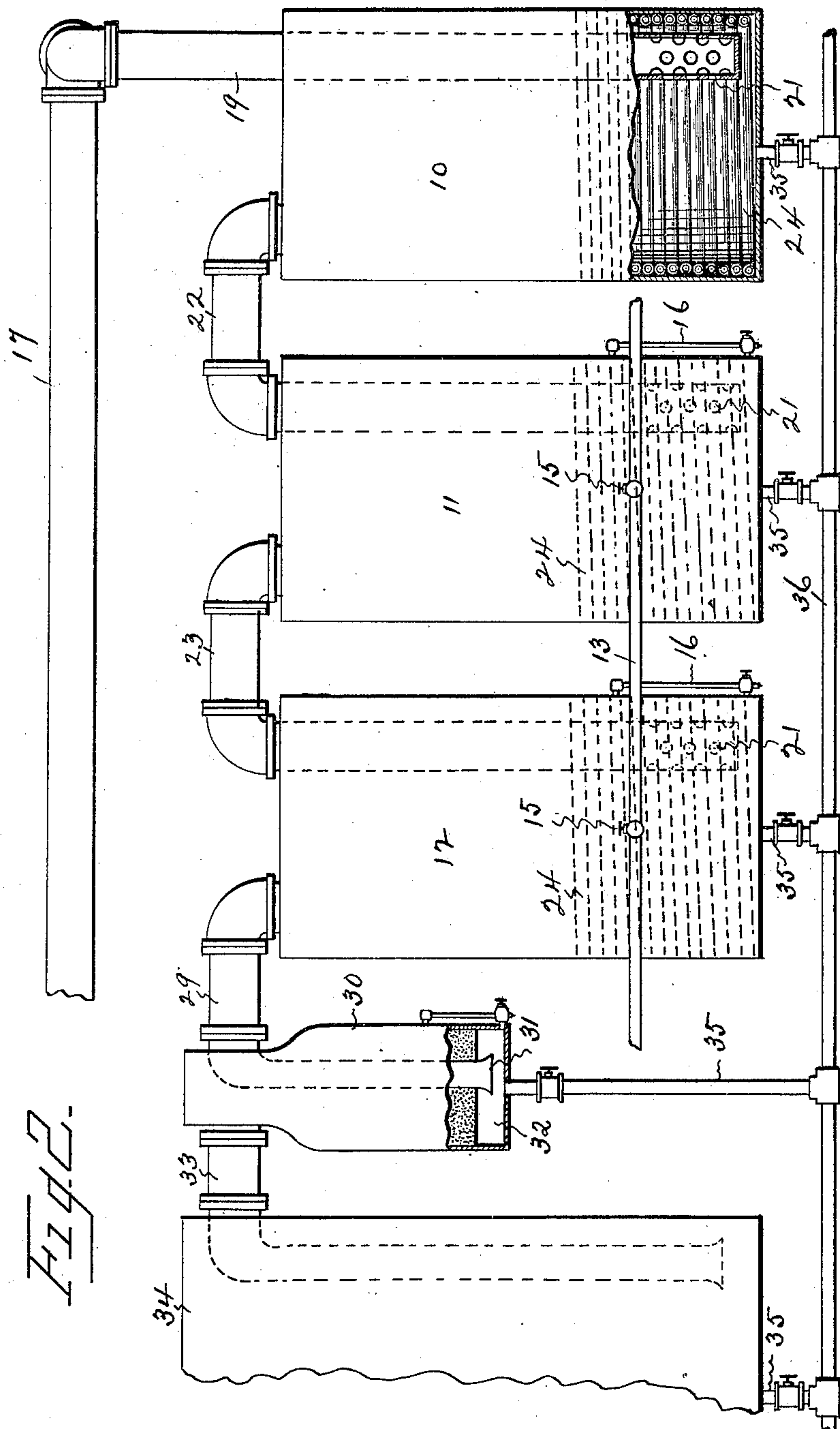
Patented Feb. 4, 1902.

H. J. DOOLAN.
CARBURETER.

(Application filed Apr. 26, 1901.)

(No Model.)

2 Sheets—Sheet 2.



Witnesses.

Lewis Hodges
Frank S. Maguire

Inventor

Henry J. Doonan,
By Wm S. Dodge atty.

UNITED STATES PATENT OFFICE.

HENRY J. DOOLAN, OF WASHINGTON, DISTRICT OF COLUMBIA.

CARBURETER.

SPECIFICATION forming part of Letters Patent No. 692,255, dated February 4, 1902.

Application filed April 26, 1901. Serial No. 57,593. (No model.)

To all whom it may concern:

Be it known that I, HENRY J. DOOLAN, of Washington, in the District of Columbia, have invented certain new and useful Improvements in Apparatus for Generating Gas; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention contemplates certain new and useful improvements in apparatus for the manufacture of gas, and relates particularly to that class of apparatus which is employed in the manufacture of gas from oil or liquid hydrocarbons.

The invention has for its object the production of a simple and inexpensive apparatus by means of which a high quality of gas may be readily and cheaply generated from the crude or heavier oils of commerce.

A further object is to provide simple and efficient means for simultaneously heating the air and oil, whereby the quality of the gas will be increased and an economy of space and material secured.

A further object is to provide the generating apparatus with a safety attachment whereby the apparatus will be saved from injury in the event of the flame lighting back from the burners.

The invention will be hereinafter fully set forth, and particularly pointed out in the claims.

In the accompanying drawings, Figure 1 is a plan view illustrating my improved apparatus. Fig. 2 is a side view thereof, parts being broken away and shown in section. Fig. 3 is a detail view.

Referring to the drawings, 10 11 12 designate three tanks, each designed to contain crude or heavy oil, which is supplied thereto through suitable main and branch pipes 13 14, leading from any source and provided with regulating-valves 15. The depth of oil in each tank is indicated by a gage 16, as shown. A forced draft of air is furnished by means of a pipe 17, leading from a pump 18, said pipe being coupled by the usual connection to a pipe 19, leading into the tank 10. The lower end of pipe 19 is closed or made solid by any suitable means, the sides of said pipe being provided below the oil-line with holes or perforations 21, the combined area of which is greater than the area of the body of said pipe. By this arrangement the tendency of the draft to raise the oil or blow it into the next adjoining tank is obviated, as the outlet thus provided will admit of the passage of a greater volume of air than the pipe can contain. The passage of the air through the oil is therefore uniform and without turbulence or disturbance of any kind, as is the case with generators now on the market. A pipe 22 leads from the top of tank 10 into tank 11, and a similar pipe 23 leads from the latter into tank 12, said pipes 22 and 23 being in every respect counterparts of pipe 19, being closed in the end and provided with holes or perforations 21.

In each of the tanks 10, 11, and 12 is located a heating-coil 24, the same surrounding, respectively, the pipes 19, 22, and 23 and extending a short distance above the level of the oil. The coils are heated, preferably, by steam conducted by means of pipes 25 26, leading from any suitable source, branch pipes 27 leading from said pipes into each tank. By this means the oil is heated and rendered volatile by direct contact with the heating medium, and the heating-coil serves to also heat the air as it enters the tanks through pipes 19, 22, and 23, thus raising the temperature thereof just as it is about to pass through the oil, the air and the oil being thus heated simultaneously. By this means a separate heater for the air, as has been heretofore required, is dispensed with, resulting in an economy of space and a corresponding decrease in cost. By this means also a high quality of gas is secured, for the reason that the air has no chance to cool before it comes in contact with the oil, but is always maintained at a high temperature. From tank 12 a pipe 28 conducts the gas to a pipe 29 of a smaller bore located within a separator 30, said pipe extending to near the bottom of said separator and having, preferably, a bell-shaped mouth or exit 31, whereby the gas is freely discharged into the receiving-chamber 32. From the latter chamber the gas passes through a bed of charcoal or other purifying material into a pipe 33, leading to the accumulator 34, said pipe being of a contracted bore within said accumulator and having a

bell-shaped exit. By making these pipes of smaller or contracted bore the volume of gas in the generating apparatus is always greater than the full capacity of the exit-pipe, where-
 5 by the latter may be taxed to its full limit by the burners without lessening or exhausting the supply thereto. By this means possibility of lighting back of the flame is reduced to a minimum. From each tank, the separator, and the accumulator lead drain-pipes
 10 35 for conducting the residuum to pipes 36, by which it is conducted to any suitable receiver. (Not shown.)

In the pipe 37, leading from the accumulator to the burners, (not shown,) I locate a check-valve, the casing of which is provided with a cap or top plate 38, secured thereto in any preferred manner, said cap or top plate having a central bore or opening 39. Between the said cap or top plate and the casing of the valve is secured a gasket 40, of rubber or other similar material. By means of this arrangement in the event of lighting back of the flame the gasket will blow out, thus
 20 relieving the pressure and minimizing the danger of wrecking the apparatus.

The operation and advantages of my improved apparatus will be at once apparent to those skilled in the art to which it appertains.
 30 It will be particularly observed that the air and oil are simultaneously heated, resulting in the saving of space and expense, that by this means a high quality of gas can be manufactured from the heavy or crude oil of commerce and in lieu of the lighter hydrocarbons, as is now the practice, and that the dangers resulting from lighting back are reduced to a minimum. It will also be understood, however, that while I have described my apparatus as specially designed for use in generating gas from the heavier or crude oils the same may be used for generating gas from the lighter oils without departing from the spirit of my invention.

45 I claim as my invention—

1. An apparatus for generating gas comprising a series of tanks, an air-inlet pipe leading into one of said tanks, pipes leading from each tank into the next adjoining tank,
 50 an outlet leading from the last of said tanks, means for supplying air to said air-inlet pipes, means for supplying oil to each of said tanks, and heating-coils located in each of said tanks, said coils surrounding each of said inlet-pipes, and extending above the normal oil-level, whereby the air passing through said inlet-pipes into the oil is heated simultaneously with said oil, substantially as set forth.

60 2. An apparatus for generating gas comprising a series of tanks, an air-inlet pipe leading into one of said tanks, pipes leading from each tank into the next adjoining tank, an outlet leading from the last of said tanks,
 65 means for supplying air to said air-inlet pipe, means for supplying oil to each of said tanks, and means located within each tank for si-

multaneously heating the oil contained therein and the air as it passes through said inlet-pipes and into said oil, substantially as set forth. 70

3. An apparatus for generating gas comprising a series of tanks, an air-inlet pipe leading into one of said tanks, inlet-pipes leading into each of the remaining tanks from the next adjoining tank, said inlet-pipes having their ends closed and provided with holes or perforations, the combined area of which is greater than the area of the bore of said pipe, an outlet leading from the last of said tanks, means for supplying air to said air-inlet pipe, means for supplying oil to each of said tanks, and means located within each tank for simultaneously heating the oil contained therein and the air as it passes through
 80 said inlet-pipes and into said oil, substantially as set forth. 85

4. An apparatus for generating gas comprising a series of tanks, an air-inlet pipe leading into one of said tanks, inlet-pipes leading into each of the remaining tanks from the next adjoining tank, said inlet-pipes having their ends closed and provided with holes or perforations the combined area of which is greater than the area of the bore of said pipe, an outlet-pipe leading from the last of said tanks, means for supplying air to said air-inlet pipe, means for supplying oil to each of said tanks, and heating-coils located in each of said tanks, said coils surrounding each of said inlet-pipes, and extending above the normal oil-level, whereby the air passing through said inlet-pipes into the oil is heated simultaneously with said oil, substantially as set forth. 90 95 100 105

5. An apparatus for generating gas comprising a series of tanks, an air-inlet pipe leading into one of said tanks, inlet-pipes leading into each of the remaining tanks from the next adjoining tank, said inlet-pipes having their ends closed and provided with holes or perforations the combined area of which is greater than the area of the bore of said pipe, a separator, a pipe having a contracted bore leading from the last of said tanks to the separator, an accumulator, a pipe leading thereto from said separator, means for supplying air to said air-inlet pipe, means for supplying oil to each of said tanks, and means located within each tank for simultaneously heating the oil contained therein and the air as it passes through said inlet-pipes and into said oil, substantially as set forth. 110 115 120

6. An apparatus for generating gas comprising a series of tanks, an air-inlet pipe leading into one of said tanks, pipes leading from each tank into the next adjoining tank, an outlet leading from the last of said tanks, means for supplying air to said air-inlet pipe, means for supplying oil to each of said tanks, means for simultaneously heating said oil and said inlet-pipes, an accumulator, an outlet-pipe therefor, and a check-valve located 125 130

in said pipe having an opening in its casing,
said opening being closed by a material of
minimum resistance, whereby in the event
of the flames lighting back said latter mate-
5 rial will be ruptured and the flame will be
prevented from entering the accumulator,
substantially as set forth.

In testimony whereof I have signed this
specification in the presence of two subscrib-
ing witnesses.

HENRY J. DOOLAN.

Witnesses:

ORRIN J. DAVY,
JOHN H. KING.