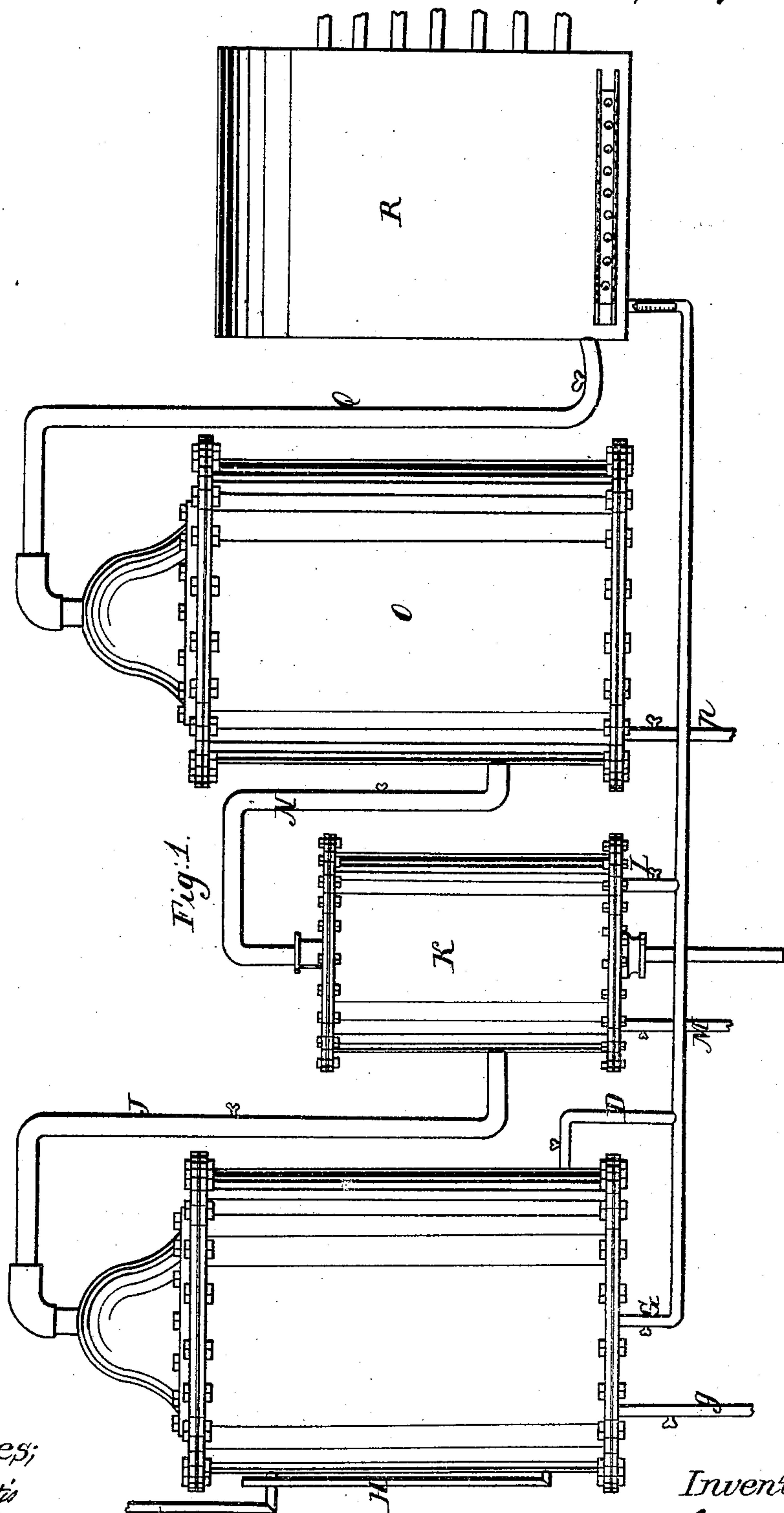


T. S. Dickerson. Sheet 1, 2 Sheets.

Hydro carbon Gas.

Nº 95,665. Patented Oct. 12, 1869.



Witnesses;
W. W. Curtis
J. A. Phillips

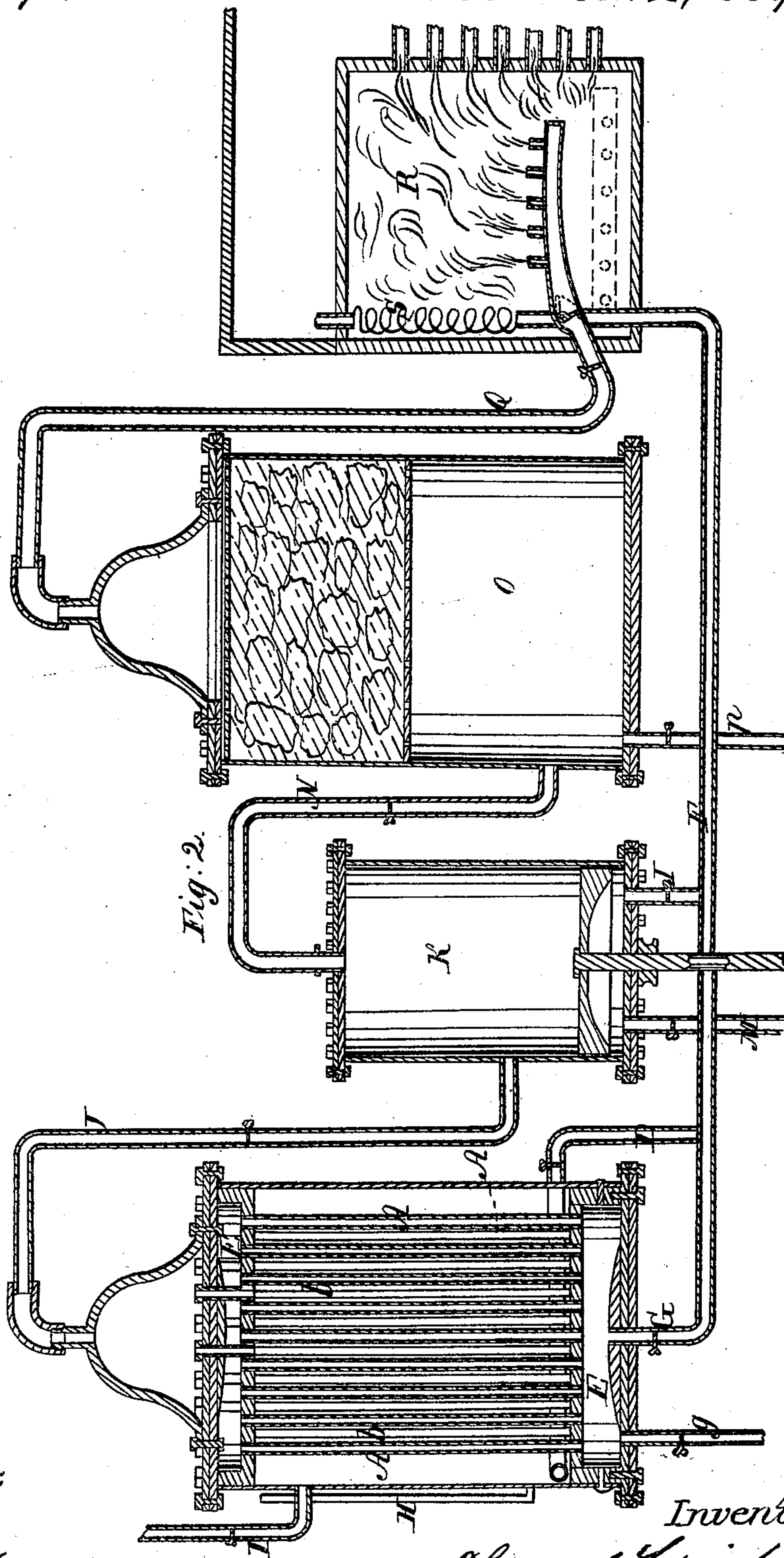
Inventor;
Thomas S. Dickerson

T. S. Dickerson. Sheet 2, 2 Sheets

Hydro carbon Gas.

Nº 95,665.

Patented Oct. 12, 1869.



Witnesses;
W. H. Curtis
J. H. Phillips

Inventor;
Thomas S. Dickerson

UNITED STATES PATENT OFFICE.

THOMAS S. DICKERSON, OF CHICAGO, ILLINOIS, ASSIGNOR FOR ONE-HALF HIS RIGHT TO RODNEY M. WHIPPLE, OF SAME PLACE.

IMPROVEMENT IN THE MANUFACTURE AND APPLICATION OF GAS FROM PETROLEUM, &c.

Specification forming part of Letters Patent No. 95,665, dated October 12, 1869.

To all whom it may concern:

Be it known that I, THOMAS S. DICKERSON, of the city of Chicago, in the county of Cook and State of Illinois, have invented a new and Improved Mode of Manufacturing or Generating Gas from Petroleum and other Oleaginous Substances, the same being a new and useful machine for the purpose aforesaid; and I hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings forming a part of this specification, in which—

Figure 1 represents an elevation of the invention, showing external of gas-generator, receiver and gas-holder, and their connections. Fig. 2 represents a sectional view of generator, receiver, gas-holder, fire-box, gas-burners, and connections taken in line of center.

Similar letters of reference in the several figures indicate corresponding parts.

The nature of my invention consists in producing gas from crude or refined petroleum or other oleaginous substances by means of superheated steam, operating in the manner hereinafter described.

I am aware that many attempts have been made to use petroleum for generating steam, and for producing heat and light, and its large heat-producing power especially recommends it; but the difficulties heretofore met with from the deposits of carbon, and consequent filling up of the pipes, and also in obtaining it in a manageable form, has prevented its use. By the application of superheated steam to form the gas, I prevent the deposition of carbon, and by first producing gas before burning I avoid the difficulties when the liquid is introduced directly into the fire-box or furnace.

The importance of this invention, if successfully applied, cannot be overestimated. The high price of coal, and the utter impossibility of utilizing it so as to get over twenty per cent. of its heating qualities, the wear and tear of machinery by the use of it, and the discomforts of passengers, renders it necessary that some substitute should be used, which shall do away with smoke and cinders, and also at all times to keep up a uniform de-

gree of heat. The machine is simple in its construction, and the result almost beyond comprehension.

To enable others skilled in the art to make and use my invention, I will now proceed to describe its construction and mode of operation.

The generator for producing the gas is composed of a cylinder made of boiler-iron, with cast-iron heads, to which the cylinder is riveted. The heads are cast with a hollow or steam-space, and connected with each other through the cylinder by tubes, as shown by letters A A. The space in the cylinder around the tubes, as shown by letters *b b*, is filled with oil. The gas escapes through the head of the cylinder into the dome by tubes, as shown by letters *c c*. The tubes have a screw cut on each end, on which a hollow nut is used, on the outside of the tube, so that it is fastened on both sides of the cylinder head, thus allowing the gas to escape from the oil-space in the cylinder to the dome above. Around the inside of the cylinder, and between the sides and the tubes heretofore mentioned, is a steam-pipe, as shown by letter D, which passes entirely around the inside of the cylinder, and is perforated in several places to let the steam escape directly into the oil. This is done to force the gas out of the oil as fast as generated, and to prevent the depositing of carbon in the pipes. Letters E E represent the steam-space at each end of the cylinder, which will be seen, allows a complete circulation of the steam. Letter F represents the steam-pipe coming from the engine. Letter G represents the steam-pipe leading into the steam-space E, with suitable stop-cock. Letter *g'* represents the escape-pipe from the steam-space E, for carrying off the condensed steam. Letter H represents a glass tube, which connects with the oil-space *b b*, which runs up on the outside of the cylinder, showing the exact amount of oil in the generator at all times. Letter I represents a pipe for filling the oil-space *b b*. Letter J represents the pipe leading from the generator to the receiver, marked K. Letter K represents the receiver, which is

made of cast-iron, and bored out, and a piston with rod operating from the bottom forces the gas into the gas-holder. Letter L represents the steam-pipe leading from the steam-pipe F, which forces up the piston and compresses the gas. Letter M represents the escape-pipe for the condensed steam under the piston in the receiver. Letter N represents the pipe leading from the receiver to the gas-holder, marked letter O. Letter O represents the gas-holder, which is made of boiler-iron, with the exception of the dome, which is cast and riveted to the top. It can be made of any size, according to its requirements. About the center of the gas-holder I place a perforated iron or tin plate, which is kept in its place by standards resting on the bottom of the gas-holder, and above this, to the base of the dome, I fill with elastic sponges, with a perforated plate at the base of the dome to keep the sponges from going in and filling up the pipe. The sponges are used for the purpose of steadying the gas, and to take up any moisture in the gas, which will condense and pass off through the escape-pipe in the gas-holder, marked *p*. Q represents the gas-pipe leading from the gas-holder to the fire-box, which is provided with suitable stop-cocks, and also a check-valve, which only opens with the pressure of the gas, and closes when the pressure is removed. R represents the fire-box and the burners, showing how the gas is consumed for fuel. S represents the coil in the fire-box, by which the steam is superheated.

The mode of operating the machine is as follows: The steam is taken from the boiler, which passes down through the fire-box R, and through the steam-coil S, into the main steam-pipe, marked F. From there it is let into the steam-space E E, which fills the tubes in the cylinder, which heats the oil in the cylinder, which immediately passes off into gas through the tubes C C into the dome, where it passes, from its own pressure, through the receiver, into the gas-holder, and from there into the fire-box of the engine. Suitable stop cocks and valves should be placed between all of the connections, which should always be under the control of the engineer.

The object and uses of the receiver are to

compress or force the gas into the gas-holder. This is done by having the connection between the generator and receiver and receiver and gas-holder secured by check-valves, which will only open by direct pressure. The receiver being full, steam is let on under the piston in the generator, which opens the valve between the receiver and gas-holder, and closes the valve between the generator and receiver, thus forcing all the gas in the receiver into the gas-holder. This can be repeated until no more gas can be forced into the gas-holder. This will furnish fuel to fire up with, and this packing of the gas is only used to keep fuel on hand when the machine is not in operation. Thus it will be seen that, after the first application, the machine has plenty of fuel on hand to generate steam.

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

1. The generator composed of steam-spaces E E, tubes A A, oil-space *b b*, steam-pipe D, when used for the manufacture of gas from petroleum and any other oleaginous substance, substantially as shown, and for the purpose set forth.
2. The receiver K with piston and rod to compress the gas, substantially as shown, and for the purpose set forth.
3. The gas-holder, when combined with the use of elastic sponges, substantially as shown, and for the purpose set forth.
4. In the apparatus herein described, the introduction of superheated steam directly into the oil, for the purpose of forcing out the gas as fast as generated, and to prevent the carbonizing in the pipes, substantially as shown, and for the purpose set forth.
5. The use and application of petroleum and other oleaginous substances for generating steam, and for heating and illuminating purposes, by the combination and the process herein described, substantially as shown, and for the purpose set forth.

THOMAS L. DICKERSON.

Witnesses:

J. H. PHILLIPS,
C. C. WILSON.