(No Model.)

H. J. BURT.

GAS GENERATOR.

No. 563,219. Patented June 30, 1896.

Fig. 1.

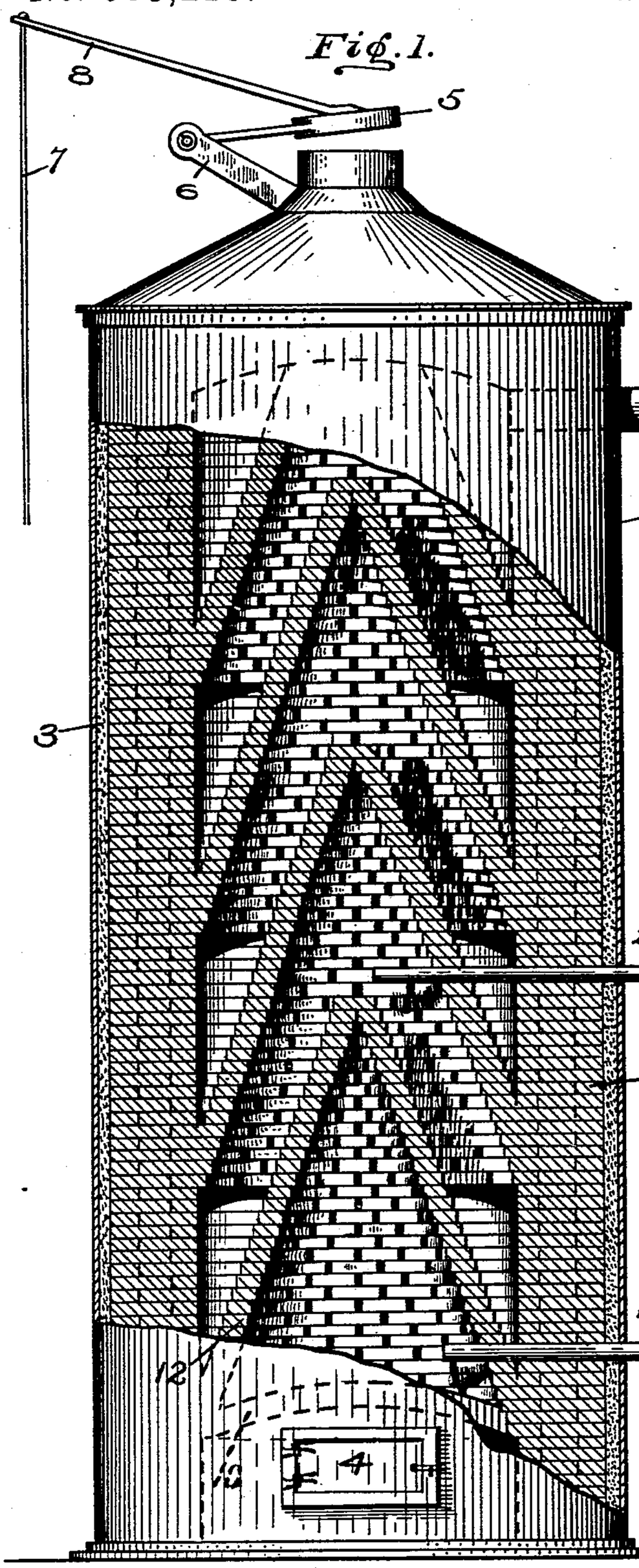


Fig. 2.

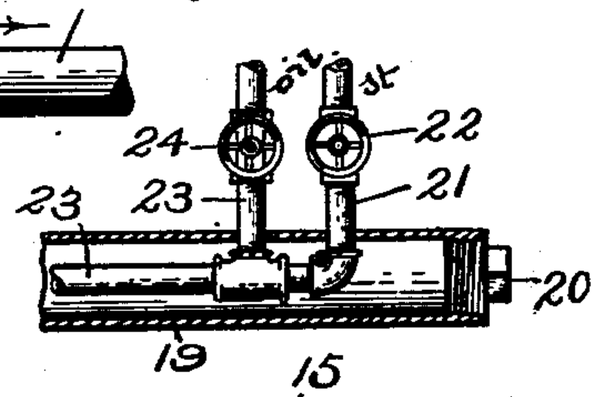
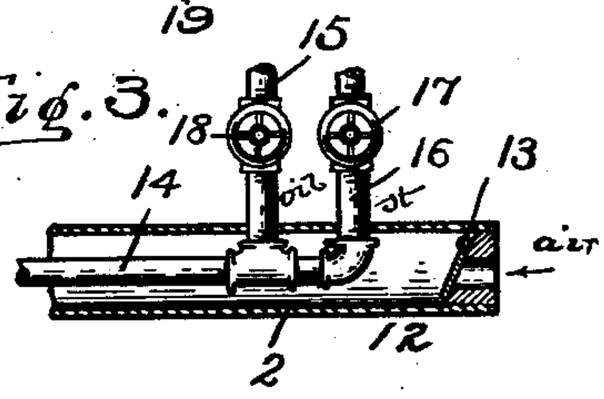


Fig. 3.



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UNITED STATES PATENT OFFICE.

HENRY J. BURT, OF LIBERTY, INDIANA.

GAS-GENERATOR.

SPECIFICATION forming part of Letters Patent No. 563,219, dated June 30, 1896.

Application filed April 22, 1896. Serial No. 588,690. (No model.)

To all whom it may concern:

Be it known that I, HENRY J. BURT, of Liberty, county of Union, and State of Indiana, have invented a certain new and useful Gas-Generator; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like numerals refer to like parts.

My invention relates to a gas-generator for the manufacture of illuminating and fuel gas by the decomposition of steam and oil by causing them to come in contact with highly-heated surfaces. The object in view is to quicken the process of such manufacture by making a heating-chamber or retort that may be more quickly heated than any of which I am aware and which when heated will more quickly and thoroughly decompose the steam and oil and convert them into a purer gas for lighting and heating purposes than any device of which I am aware. By this I am enabled to produce a good quality of gas at a very low price. The full nature of my invention will appear from the accompanying drawings and the description and claims following.

In the drawings, Figure 1 is a side elevation of the generator with the middle portion shown in vertical section. Fig. 2 is a detail sectional view of the means for introducing the steam and oil for making the conversion into gas, and Fig. 3 is a detail of the device for introducing fuel for heating the generator.

The body of the generator consists of the cylindrical brick wall 1 with a chamber in it from bottom to top. About this brick wall is built an outside metallic covering 2, so that there will be some space between the brick wall and the metallic covering, in which I place a filling 3 of ashes or other non-conductor of heat. At the lower end the device is provided with a door 4 and at the upper end with a lid 5, carried on the arm 6 and opened or closed by the rope 7, suspended from the handle 8, that is secured to the lid. While the generator is being heated the lid is elevated to make a draft or flue through the device, but while gas is being generated the lid is closed. Preferably at the upper end I place a pipe 9, leading from the interior chamber of the generator, for the removal of the gas.

At the lower end of the chamber within the generator I provide an arch 10, likewise one at the upper end. (Shown in dotted lines.) The chamber contains a series of cones 11 with their apexes extending upward. They are separated considerably from each other, so that the apex of one extends up into the one above to a point about half-way. The bases of the cones are built into and rest upon the interior portion of the cylindrical wall 1. These cones are built of brick or similar material in the form of what is called "open-work," that is, the ends of the bricks do not abut against each other, but are so laid as to have between them considerable space. The apex of each cone is preferably closed, as shown.

The generator is heated by the introduction of fuel at its lower end just within the lower part of the lower cone. For this purpose I introduce a large air-pipe 12, having screwed into its outer end a gravity-valve 13, so that air may pass inward when there is a draft but cannot pass outward. Within the pipe 12, or what we might call a "burner," extends a pipe 14 to convey crude oil from the pipe 15 and steam through the pipe 16. These two become mixed in passing through the pipe 14 and become further mixed with each other as well as with air when they escape from said pipe 14, the air coming through the pipe 12. Any other cone or burner may be used provided it mixes the materials so as to produce a powerful heat.

In the manufacture of gas the supply or generator is first heated through the means just described until the temperature of the interior construction, that is the bricks in the cones, is raised to about 1,900° Fahrenheit. When the proper temperature is obtained, the supply of steam and oil is shut off by means of the valves 17 and 18.

It is obvious that, by reason of the peculiar construction of the cones and their peculiar arrangement in relation to each other, the bricks forming the cones are very quickly heated. This is due to the great amount of surface of each brick that is exposed to the heated gases within the generator and also to the remarkable distribution of such heated gases that is effected by reason of the arrangement set forth. It is observed that the heated

air or gases come in contact with the two sides of each brick and also its two ends and likewise with a large portion of both the top and bottom. In other words, nearly all the surface of the bricks is exposed, whereby, as is clearly seen, it will become much more quickly heated. The heated gases formed within, say, the lower cone pass through the various openings in such cone in their journey upward. Since these openings are very numerous and distributed all about the surface of the cone and since the inner surface of the cone inclines inward to deflect the passage of the heated gases as well as to cause them to pass through the openings and, furthermore, since the heated gases mingle largely in passing from one cone to another, it is clear that the heated gases will be equally distributed and all parts of all the cones become equally heated within the same period of time. No particle of heated gas can pass directly upward in a straight line, but is deflected hither and thither from one surface to another, imparting its heat at every point of contact. From this explanation it is seen that the bricks in the cones will become very quickly heated, and not only that, but all parts will become quickly heated within the same period of time, so that no portions will be underheated while other portions are overheated. After these brick cones are heated, as has been described, the supply of fuel is shut off and the lid 5 closed and the material for the manufacture of gas is then introduced through the pipe 19. I close the outer end of such pipe with the nut 20. Into said pipe extends a steam-pipe 21 with the valve 22 and an oil-pipe 23 with the valve 24, one coming from a suitable oil supply and the other from a boiler and the two emptying into the pipe 25, that extends through the pipe 19 to its inner end.

The pipe 19 extends into the generator to a point about the center of the second cone from the bottom, so that the fluid is deposited by it upon the apex of the lower cone. Since said lower cone is highly heated, as has been explained, and the fluid flows upon the apex and runs down all round its sides, thus becoming well distributed, it is very quickly evaporated and passes upward, the nascent gases and vapors thoroughly mixing and being decomposed by contact with the heated surface before they pass out through the pipe 9.

The point I claim is that the conversion or decomposition in my generator will be unusually thorough because of the remarkable distribution and mingling of the particles of gas and vapors as they pass through the various openings in the cones and from one cone to another in a series and because no particles of the vapors and gases can pass through all the cones and openings therein without at some time in the movement coming in contact with a heated surface, whereby they will be thoroughly decomposed. This decomposition will also be very quickly done for the reasons heretofore explained. As soon as the gas is formed and passes out through the pipe 9 the process which has been described is repeated. These charges and discharges I have found are much more rapid with the form of device I have described than with any other of similar nature of which I am aware.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a gas-generator, a series of apertured cones one beneath the other with their apexes extending upward.

2. In a gas-generator, a series of apertured cones with their apexes closed and extending partially into each other in series.

3. In a gas-generator, a series of cones built into the chamber therein and consisting of open brickwork with their apexes extending upward and somewhat into each other in series.

4. In a gas-generator having a generating-chamber, means at the upper end for removing the gas, means at the lower end for introducing gas-making material, a series of cones made of open-work built into the chamber one above the other, and means for heating said cones.

5. In a gas-generator having a generating-chamber therein, a series of cones made of open-work built within said chamber one above the other, means at the lower end of such chamber for heating such cones, and a pipe for discharging gas-making material on the apex of one of the cones.

6. A gas-generator comprising a retort or generating-chamber, a series of cones built of open brickwork within such chamber one above the other with their apexes closed, a burner extending into the chamber below the lower cone for heating the gas, a pipe extending into the chamber at the apex of the lower cone for the discharge of gas-making material on the apex of said cone, and a pipe leading from said chamber at its upper end for conveying the gas therefrom.

In witness whereof I have hereunto set my hand this 3d day of April, 1896.

HENRY J. BURT.

Witnesses:
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