

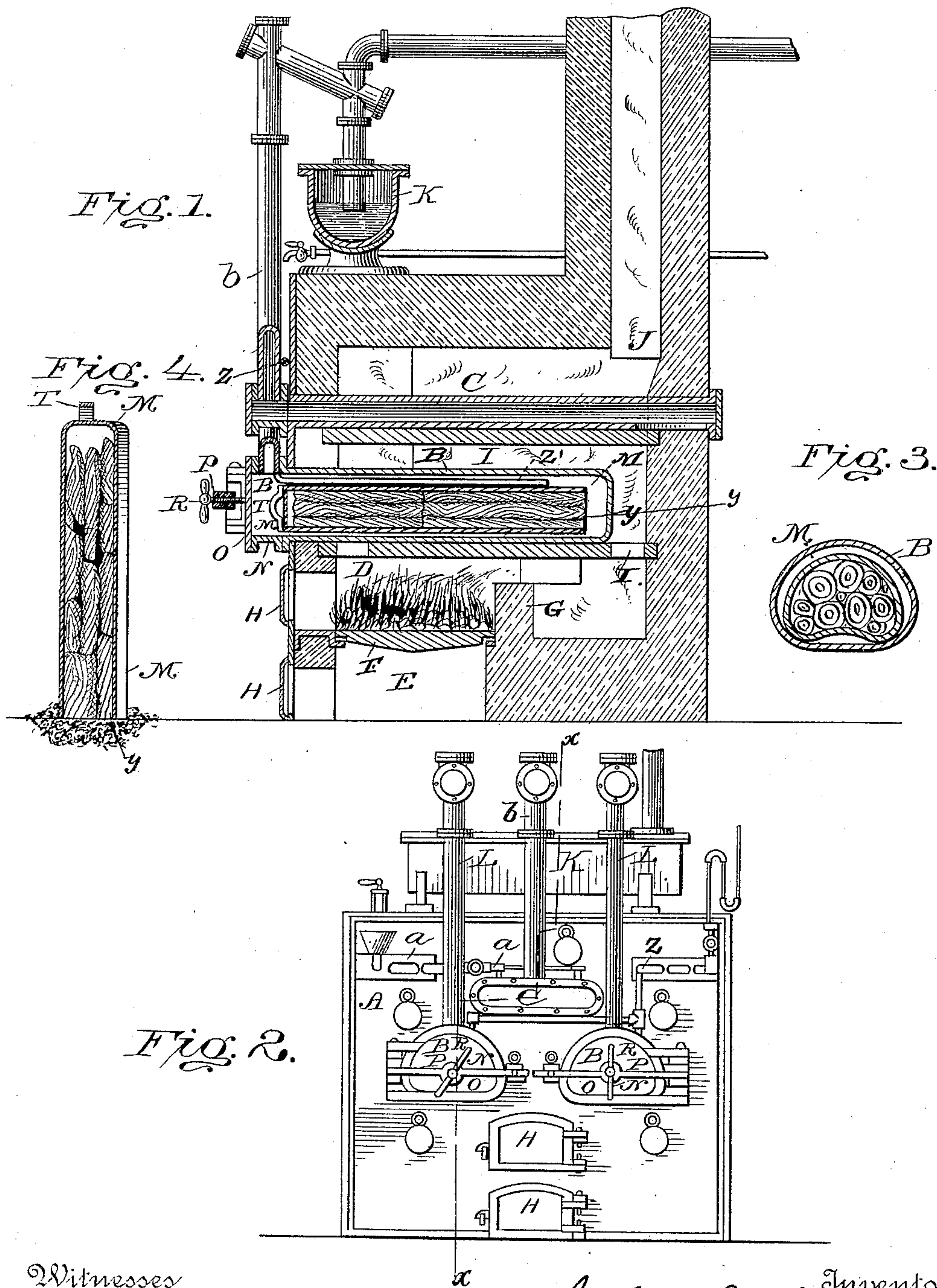
(No Model.)

J. D. AVERELL.

APPARATUS FOR THE MANUFACTURE OF GAS.

No. 398,306.

Patented Feb. 19, 1889.



Witnesses
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UNITED STATES PATENT OFFICE.

JOHN D. AVERELL, OF BROOKLYN, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO JOSÉ F. TORAYA, OF PHILADELPHIA, PENNSYLVANIA.

APPARATUS FOR THE MANUFACTURE OF GAS.

SPECIFICATION forming part of Letters Patent No. 398,306, dated February 19, 1889.

Application filed October 23, 1886. Serial No. 216,996. (No model.)

To all whom it may concern:

Be it known that I, JOHN D. AVERELL, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Apparatus for Generating Gas, of which the following is a specification.

My invention relates to an improved apparatus for generating wood-gas; and it consists in certain novel features of construction and combinations of parts, more fully described hereinafter, and particularly pointed out in the claim.

Referring to the accompanying drawings, Figure 1 represents a vertical longitudinal section of a retort-bench, taken on the line x x , Fig. 2. Fig. 2 is a front view of the same on a more reduced scale; Fig. 3, a cross-section of the retort and cartridge. Fig. 4 is a vertical section of a wood-cartridge in position while smothering its contents.

In the drawings, A represents a suitable furnace, in which one or more wood-distilling retorts, B B, are employed, and an oil-retort, C, preferably located above the retorts B B.

D indicates the fire-chamber; E, the ash-pit; F, the grate; G, the bridge-wall, and H the fire and ash-pit doors.

The retorts B and C have beneath them tiles I for the protection of their bottoms against the intense heat. The furnace is suitably arched over the retorts to distribute the heat over them, and the top of the rear part of the arch connects with the chimney J of the furnace. The oil-retort C passes through the furnace and has suitable lids on each end, which can be readily removed for cleaning the retort. The oil for this retort is heated in the heating-pipe Z, which is arranged partly in the lining of the furnace and passes the oil several times back and forth in the furnace. Said retort has one central chamber and one to each side of said central chamber, into which two chambers the oil is introduced from said pipe Z, and from thence into said central chamber, from which the oil-gas passes by means of the stand-pipe b to the hydraulic main K, located on the top of the bench. The gases generated in the wood-retorts pass into the same hydraulic

main by means of the stand-pipes L, and all gases contained in the hydraulic main pass through the usual scrubbing process, and from there to the holder for use.

The wood-retorts B B have each a suitable mouth-piece, N, furnished with a proper jointed door, O, strongly hinged to said mouth-piece, and each door is furnished with a hinged pressure-bar, P, carrying the pressure-screw R, and a slotted staple or other suitable fastening is provided for the loose end of the pressure-bar. The retorts may be round or other shape, the D shape being preferred, as shown.

z represents a steam-pipe, which may be connected direct with a steam-boiler, or it may be connected with a steam-heating or hot-water pipe passing through the lining of the retort-furnace, as shown in Fig. 2. For each retort such a pipe, z , is employed, entering at the mouth-piece and passing to the rear or inner end of the retort to discharge a suitably regulated amount of steam during the process of distillation and to come in contact with the wood.

In each retort for the charge of wood I employ a solid sheet-metal wood-cartridge, M, which has its forward end tightly closed and furnished with a handle, T. The rear end of this cartridge is open, and as it is being charged with wood the closed end is held down and the wood inserted from the top into the open end of the cartridge. Relative to the dimensions of the retorts said cartridge is made smaller to allow the gases generated to pass between the inner side of the retort and over the outside of the cartridge, for which purpose the bottom of the cartridge is made concave to allow a longitudinal passage under it. Said concave portion at the bottom of each cartridge and over the bottom of each retort forms a very hot space, through which the highly-heated gases pass, thereby fixing the same. By means of the steam-pipe z the steam is conducted to the wood and disintegrates and softens the solid matters and extracts the same, and in this way assisting beneficially in the generation of the gas. Relative to the length of the retort the cartridge is made sufficiently shorter to allow

plenty of space for the generated gases to escape from the open end of the cartridge into the rear end of the retort, from where the gases pass forward over the cartridge to the
5 mouth-piece, from which they pass into the stand-pipes to the hydraulic main. The gases passing close to the sides of the highly-heated retort are superheated and fixed by the same before passing from the retort. Several of
10 the cartridges are usually employed to enable the attendant to have a ready-charged cartridge on hand as soon as required. After the gas is extracted from the wood the retort is opened and the cartridge is quickly with-
15 drawn. A flat cover (not shown) is then placed over its open end and the cartridge is placed in sand with its open end down (the flat cover having been removed) to seal said end and exclude the air from the charcoal,
20 so that the charcoal within the cartridge is smothered and saved from consumption and reduction, and consequently is produced in a valuable mercantile condition. The cartridge

withdrawn from the retort is immediately substituted by a second cartridge ready 25 charged, and thereupon the retort is closed.

What I claim is—

In a wood-gas-generating apparatus, the combination, with a closed retort, of an im-
perforate wood-cartridge case having an open 30 inner end and adapted to removably rest in said retort and leave heating-spaces between the cartridge and inner wall of the retort, and a steam-supply pipe extending into said re-
35 tort between its inner wall and the cartridge to discharge steam at or near the inner open end of the cartridge, for the purpose set forth.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of two witnesses, this 16th day of 40 October, 1886.

JOHN D. AVERELL.

Witnesses:

REINHOLD BOEKLEN,
W. J. STOREY.