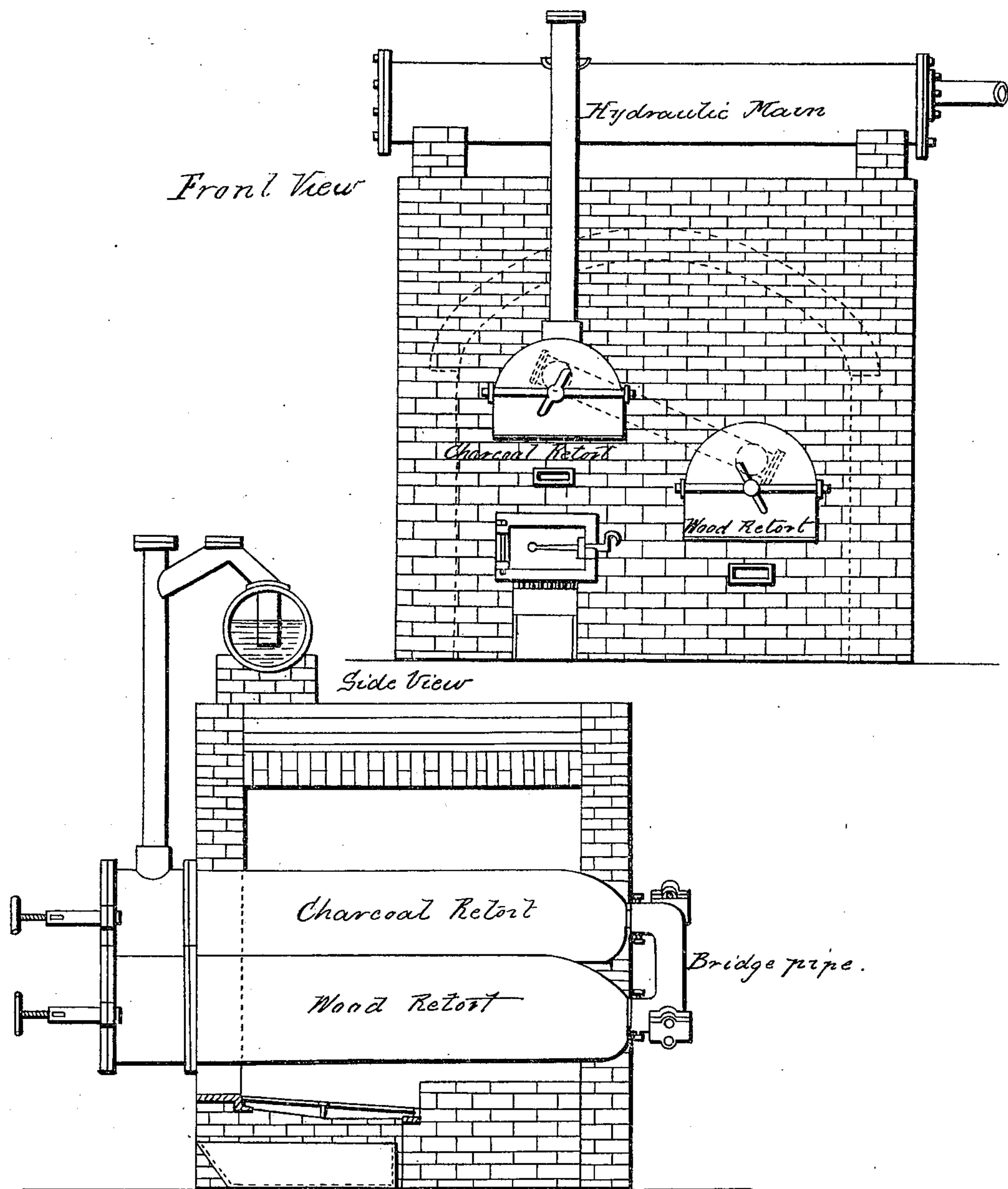


L. R. BREISACH
MAKING GAS FROM WOOD.

No. 25,316.

Patented Sept. 6, 1859.



Witnesses,
Friedrich Hinke
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UNITED STATES PATENT OFFICE.

LEOPOLD RICH'D. BREISACH, OF NEW YORK, N. Y.

IMPROVEMENT IN MAKING GAS FROM WOOD.

Specification forming part of Letters Patent No. 25,316, dated September 6, 1859.

To all whom it may concern:

Be it known that I, LEOPOLD RICHARD BREISACH, of the city, county, and State of New York, have invented new Improvements in the Mode of Making by Dry Distillation Lighting-Gas from Wood and Woody Fiber; and I hereby declare the following to be a full, clear, and exact description of the same.

My said invention consists in the application of a certain series of temperatures to two horizontal D-shaped retorts, each retort to have a range or series of temperatures of its own, and these two retorts made of iron or clay, such as are commonly used at present in gas-works, (or if for private works of smaller dimensions,) the one retort filled with billets of well-seasoned wood (charged in an iron scoop or without it) and the other retort charged with proportionate quantities of charcoal, and these two retorts set in the furnace such as suitable to the gas-maker—that is, either parallel to each other and the mouth of both on the same side, or parallel and the mouth of one forward and of the other aft, or so in one straight line—and these two retorts to be connected by a bridge-pipe for conveying the vapors, &c., from one to the other.

I shall now describe my improved process and the contrivances therefor, compared with the old one and its contrivances.

Hitherto it has been the practice to use for wood-gas making one retort with metallic chambers or otherwise, called “cellularshells,” and the like, the whole cast of one piece or composed of one piece, and the process tending only to have a great surface, which, however, from the nature of the contrivances, could but have an almost equal temperature throughout the whole of the passages. Therefore the result thus obtained could also be effected by one single retort without any metallic chambers or cellular shells. As the iron of the retort is a better conductor of heat than the wood to be distilled, there is a lower temperature in the gas-generating substance than in the surrounding retort, and the vapors evolved immediately touching it become heated higher; but this and the application of a retort with chambers is an imperfect mode of making gas, because if the contrivances be heated too high the olefiant

gas decomposes to light carbureted hydrogen and the lighting-power of the generated gas decreases. If the whole contrivance is heated too low, too much tar and too little gas are manufactured. I use, therefore, two retorts apart from each other, but connected by a short bridge-pipe, and by setting them as stated the application of a proper temperature for each one is practicable, needing only the construction of proper flues with a damper, and this is effected even without consuming more fuel, as the heat going off from the redistilling charcoal-containing retort is serviceable for the other wood-containing retort. If the two retorts are properly set and connected by a bridge-pipe, they are filled the one with well-seasoned wood, sufficiently chopped to allow the heat to penetrate at once the whole porous substance, and the other retort with such a proportionate quantity of charcoal as will be explained. If, then, the heat is kept up in the latter-mentioned retort to about 1,400° to 1,650° Fahrenheit, or to a cherry-red, and in the first to about 750° to 850° Fahrenheit, or to a faint red color, the aqueous vapors, carbonic acid, carbonic oxide, acetic acid, the highly-carbonaceous oils, and the carbides of hydrogen pass off through the connecting bridge-pipe to the charcoal-containing retort, and here coming over in their nascent state these products combine to form olefiant gas, light carbureted hydrogen, carbonic oxide, free hydrogen, and some carbonic acid gases, fluid pyroligneous acid, and vegetable tar.

As the incandescent charcoal in the higher-heated retort offers a great heated surface to the products coming through the bridge-pipe, the quantity of charcoal used ought to be regulated according to the moisture of the wood and its density—that is, if more moist, more charcoal; if more porous, more charcoal; and less moist and porous, less charcoal. Thus, for instance, if pine wood is used, varying as it does in its quality, about eight to twelve pounds of charcoal will do for one hundred pounds of wood. However, if gas has to be distilled from oak wood, about six to eight pounds of charcoal, according to the quality of the oak, will be sufficient for one hundred pounds of wood. It is also of great moment to regulate the pressure in the re-

torts, which is dependent upon the depth of the dipping-pipe in the hydraulic main, (opening, as it does there, under the tar,) next upon the washer, condenser, purifier, and gas-holder. A too great pressure will keep the gases too long in the two retorts, which would be injurious, taking into consideration that wood begins to decompose under a temperature of 450° Fahrenheit.

It is understood that the other arrangements—that is, the different modes of setting the hydraulic mains, washer, condenser, purifier, and gas-holder—remain the same as now; but, nevertheless, with my improved mode a greater quantity and better quality of gas will be obtained.

Therefore I claim and wish to secure by Letters Patent—

The process of manufacturing illuminating-gas from wood by distilling the same in two retorts of varying temperatures, as set forth, one of which retorts is charged with charcoal varying in amount according to the conditions indicated, the whole process being conducted as herein set forth.

New York, February 1, 1859.

LEOPOLD RICHD. BREISACH.

Witnesses:

FRIEDRICH HINKE,
HENRY L. SCHRADER.