S. MEREDITH.

DISTILLING COAL WITH HYDROGEN GAS.

No. 13,358. Patented July 31, 1855.

Fig. 1

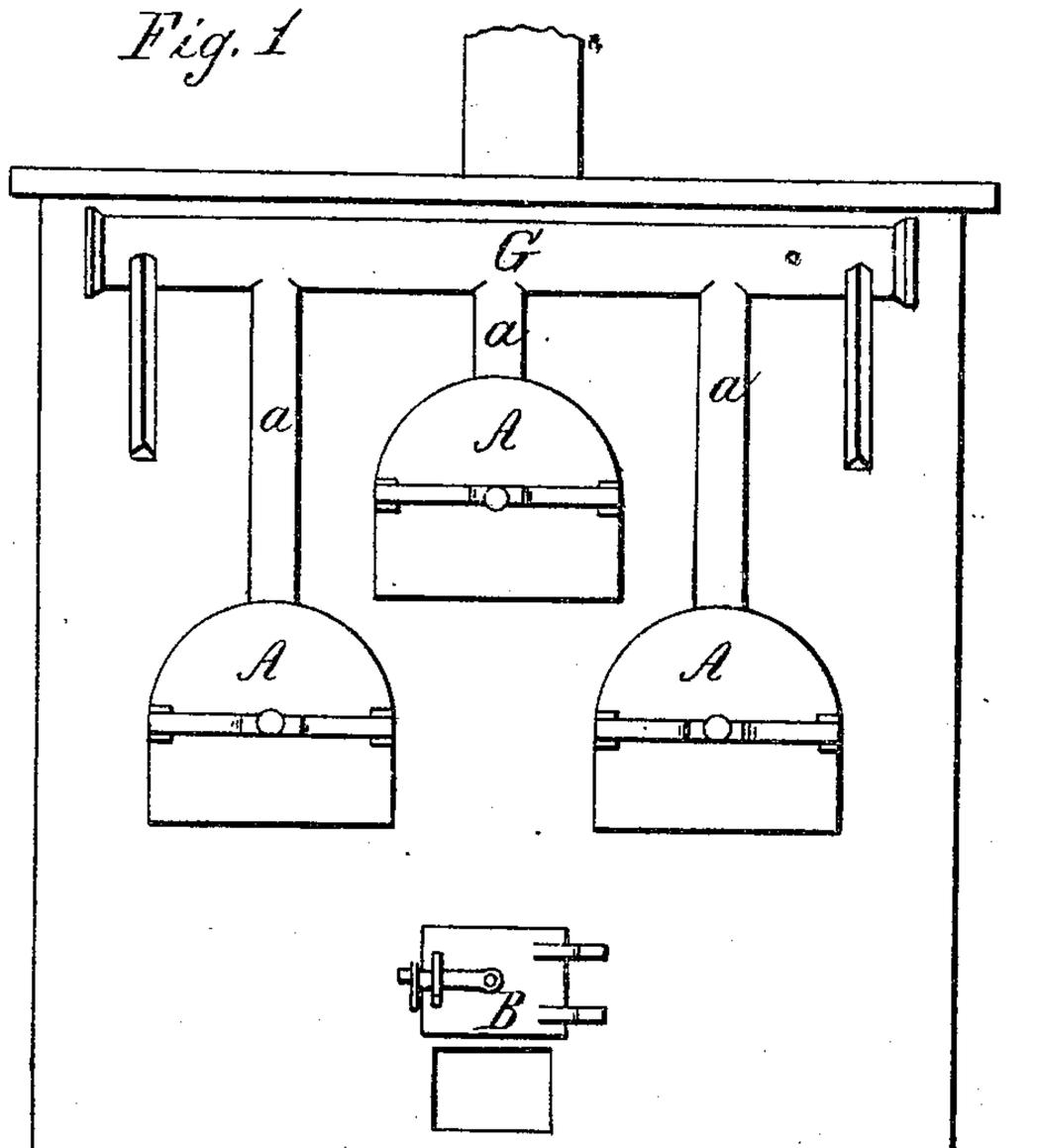
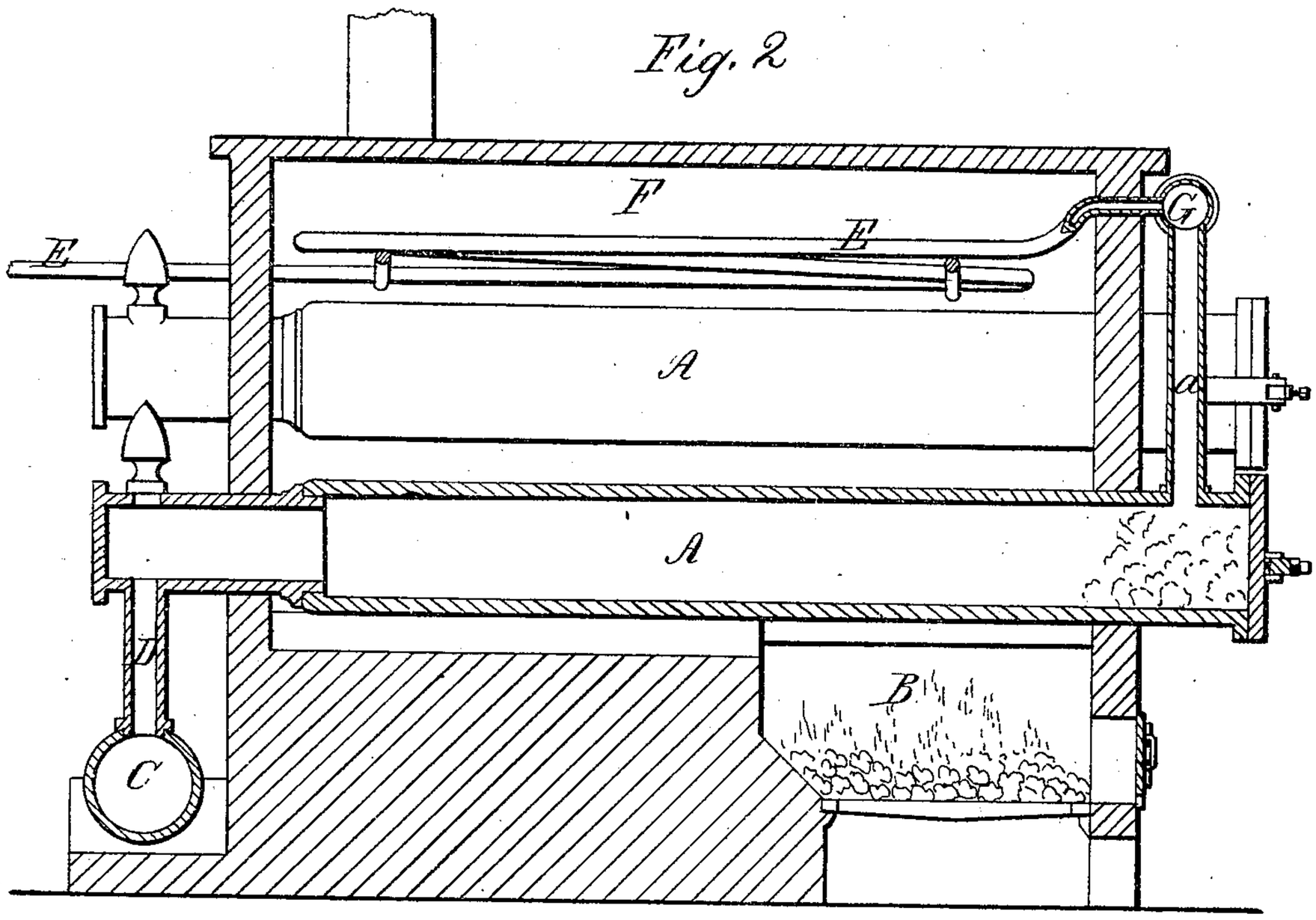


Fig. 2



UNITED STATES PATENT OFFICE.

STEPHEN MEREDITH, OF MEADVILLE, PENNSYLVANIA.

DISTILLING COAL WITH HYDROGEN GAS.

Specification of Letters Patent No. 13,358, dated July 31, 1855.

To all whom it may concern:

Be it known that I, STEPHEN MEREDITH, of Meadville, in the county of Crawford and State of Pennsylvania, have invented a new and useful Improvement in the Distillation of Cannel or other Bituminous Coal to Produce Benzole, Naphtha, and other Hydrocarbon Fluids for Illuminating and other Purposes; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1, is a front view of my distilling apparatus, and Fig. 2, a longitudinal vertical section of the same.

Similar letters of reference indicate corresponding parts in both figures.

It is well known to chemists and others who have experimented in the destructive distillation of coal, that at different degrees of temperature products of very different character are produced, gaseous, liquid, and solid. The gaseous products consist of marsh gas, olefiant gas, carbureted hydrogen, and carbonic acid; the liquid products consist of bodies closely analogous to petroleum and the solids are coke and mineral pitch. The relative proportions of the above products vary with the temperature, the lower the temperature employed the less gas and the more liquid produced, and an increased temperature producing more gas. At the high temperature required to produce good coke there is little or no liquid produced except tar, while at the low temperature necessary to give the best product of liquids the coke would be spoiled; and even at that low temperature there would be a large amount of permanent gas made which would be lost.

The object of my invention is to obtain a large product of liquids and also coke of good quality, and also to work off a charge of coal more rapidly than can be done by simple distillation at a low heat, and for this purpose the nature of my invention consists in the admission to the retorts during the distilling operation of a jet of heated hydrogen gas. In this way the liquids are distilled in an atmosphere of hydrogen and thus preserved from igneous decomposition and the hydrogen at the same time takes up a portion of the sulfur and ammonia contained in the coal.

In carrying out my invention I employ a bench of retorts, of the usual kind. A, A, A, in the drawing represent these retorts; B, the furnace; C, the hydraulic main; and D, the pipes leading from the retorts to the hydraulic main.

E, is a pipe entering the oven F, at the rear end and passing circuitously or in serpentine form through the oven and connecting outside with a pipe G, which runs over the whole of the retorts and is furnished with a branch *a*, to lead to every retort. This pipe conveys the hydrogen gas to the retort and heats it in its passage through the oven. The retort should be kept at a cherry red heat. The pipe which conveys the hydrogen should be kept at a similar heat, and the distillation should continue for about six hours. The hydrogen gas may be produced by any of the known methods and may be admitted directly to the pipe E, from the retort in which it is made or from a receiver or gas holder, but I desire it to enter the retorts A, A, A, in a heated state. Suitable means may be employed to convey the hydrogen after condensation has been effected to burn it under the retorts A, A, A, or under the stills to be employed in the further purification of the liquids, which I re-distil with about one tenth part of their bulk or with ten (10) gallons of the milk of lime, to every hundred (100) gallons of the liquids, when they will be sufficiently pure for common use.

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

The production of naphtha, benzole and other hydrocarbon liquids by the distillation of cannel or other bituminous coal in an atmosphere of heated hydrogen gas or in a retort to which a stream of heated hydrogen gas is admitted during the distilling process substantially as and for the purposes herein set forth.

STEPHEN MEREDITH.

Witnesses:

H. METTUMS,

A. TAYLOR.