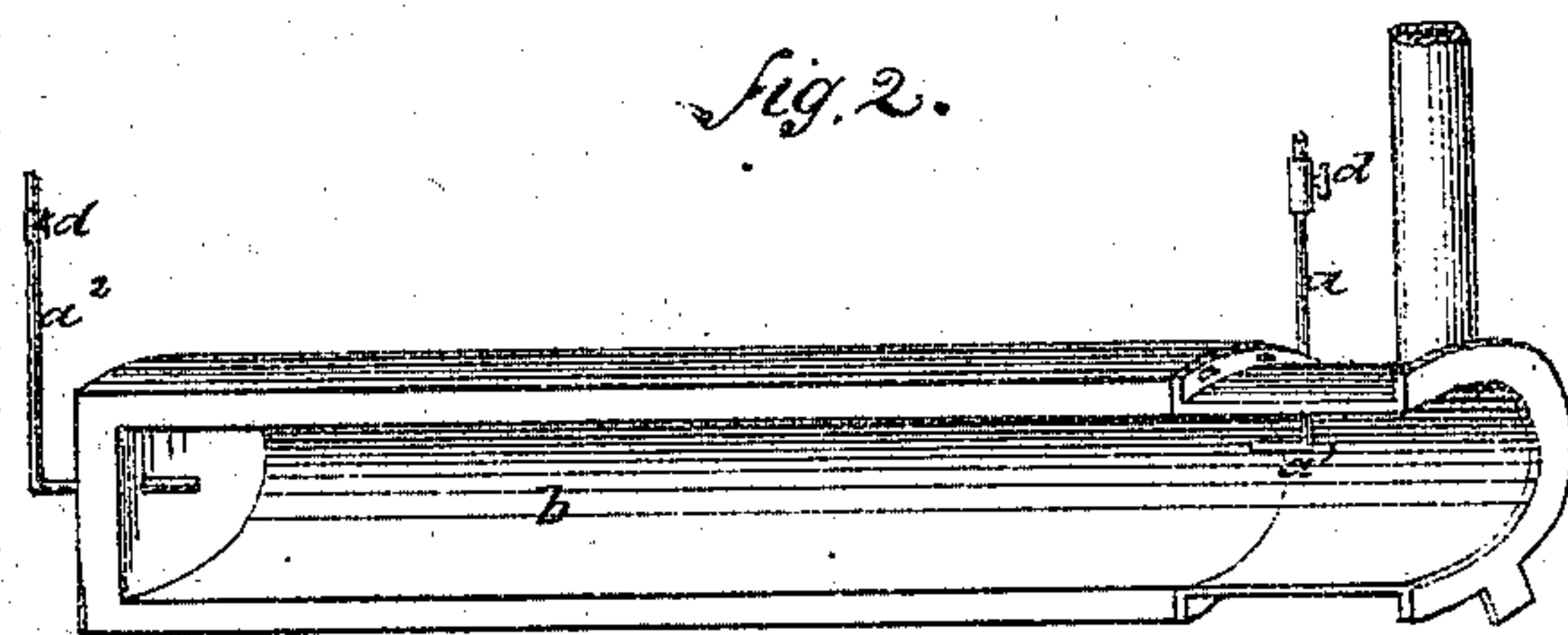
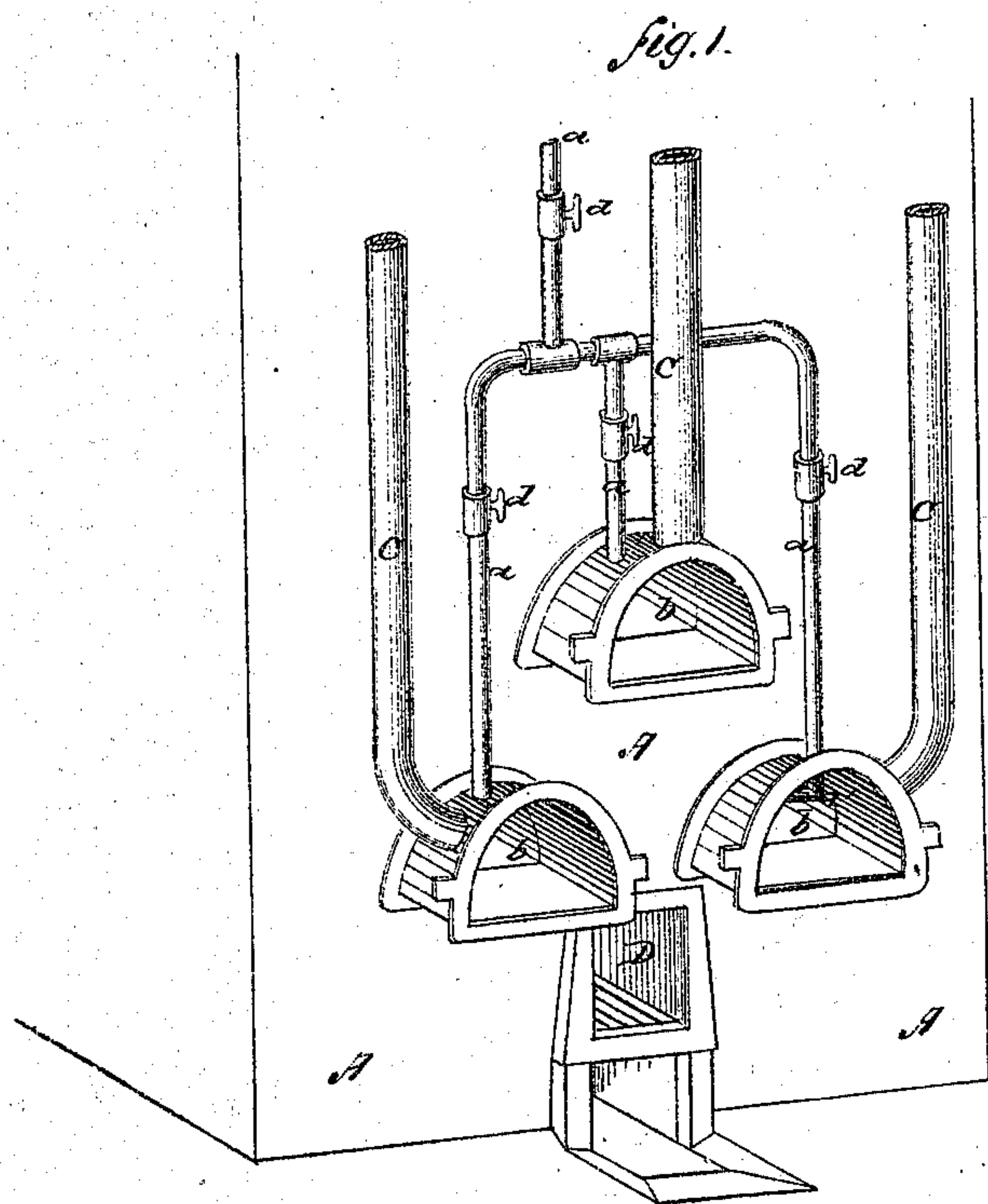


A. Harner,
Gas Generator
No. 97632. *Patented Dec. 7, 1869.*



Witnesses:

Victor Hagmann
John Ross.

Inventor:

A. Harner
to

UNITED STATES PATENT OFFICE.

ALEXANDER HAMAR, OF PHILADELPHIA, PENNSYLVANIA. •

IMPROVED MODE OF GENERATING ILLUMINATING-GAS.

Specification forming part of Letters Patent No. **97,632**, dated December 7, 1869.

To all whom it may concern:

Be it known that I, ALEXANDER HAMAR, of Philadelphia, State of Pennsylvania, have invented a new and useful Improvement in the Mode of Generating Gas, and devices connected therewith; and I do hereby declare that the following is a clear and exact description thereof, which will enable others skilled in the art to make and use the same, reference being had to the accompanying drawings, forming part of the specification.

Figure 1 represents a set of retorts with steam-pipes. Fig. 2 represents a sectional view.

The nature of my invention consists in the introduction of jets of steam into the gas-retorts while generating gas; also, in the means by which it is accomplished, whereby the carbonization of the retorts is prevented, and a larger quantity and better quality of gas are produced from the same amount of coal, and less lime is used for purifying the gas.

I connect a set of retorts, *b b b*, with small pipes *a a a*, which are provided with stop-cocks. Each of these pipes is set into the mouth-piece of a retort, with the bend *a'* facing toward the rear of the retort, which enables me to force the steam toward the opposite end and through the entire length thereof.

The same result may be accomplished by introducing the steam-pipes through the rear of the retorts, as shown in Fig. 2; but I prefer to set them in the mouth-pieces.

The operation is as follows: The retorts are charged with coal in the common way, and one hour subsequent to the charge being introduced I open the stop-cocks *d* and force the steam into the retorts for two minutes, after which the steam is shut off again, and the gas is left to generate for another hour, when the introduction of steam through the pipes is renewed. The length of the flow of steam being a little more than at first, the quantity of steam to be introduced depends on the quality of coal, harder quality requiring more. Subsequent to the second introduction of steam

the gas is again permitted to generate until a few minutes previous to the time for lifting the lids from the retorts, which is done for the purpose of removing the coke, when steam is again introduced for a minute or two.

The chemical process is as follows: When the coal has no more hydrogen to give off freely its gases, hydrogen is supplied by means of steam, these combining the hydrogen with the carbon, (which latter otherwise would remain lying on the inner surface of the retort,) and carrying it off through the exhaust-pipes as carbureted hydrogen, and thereby increasing the production of gas.

Another and very material gain in the quantity of gas produced by my means is, that the steam introduced into the retorts previous to the lifting of the lids drives the gas into the gasometer, whereas by the old process the retorts were always full of gas, which at the time of lifting the lids escaped.

The saving by means of my process is twenty per cent. over the ordinary method.

Another advantage is the prevention of accumulation of carbon in the retorts.

In the common way of generating gas the accumulated carbon in the retorts has to be burned out, the process of which takes from eight to ten days, the expense of fuel, and often injury to the retorts themselves.

Claims.

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

1. The introduction of jets of steam into the gas-retorts during the time the gas is being generated, substantially as and for the purpose set forth.

2. The combination of the mouth-piece of the retorts with the steam-pipes, substantially as and for the purpose set forth.

A. HAMAR.

Witnesses:

T. C. CONNOLLY,

THS. C. WOODWARD.