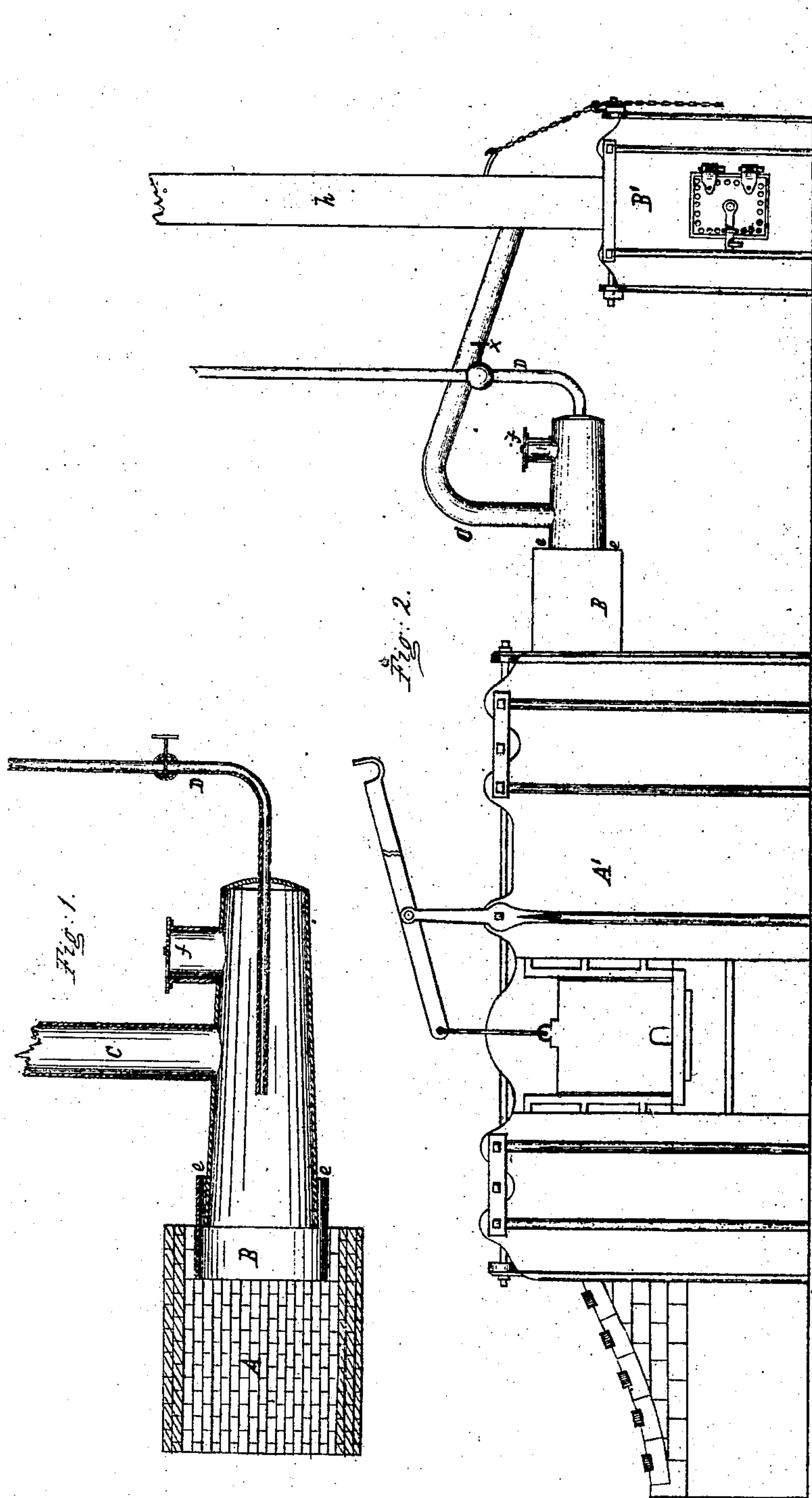


Hill & Thuman,

Gas Furnace.

No. 95,686.

Patented Oct. 12. 1869.



Witnesses John Lockie
Geo. D. Patton

Inventors. El. A. Hill & Chas. F. Thuman
By their attorney L. L. Johnston

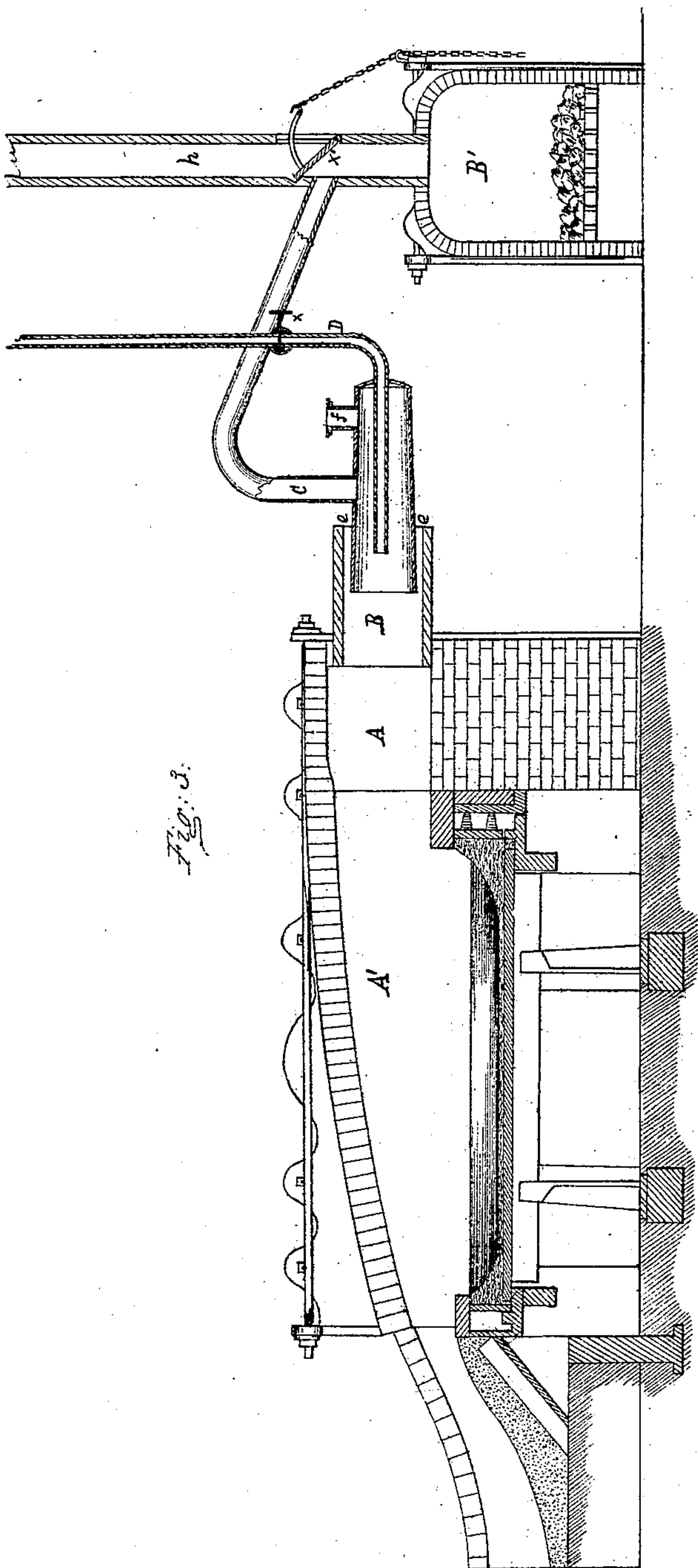
Hill & Thummin,

2. Sheets, Sheet 2.

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United States Patent Office.

SAMUEL A. HILL AND CHARLES F. THUMM, OF OIL CITY, ASSIGNORS TO THEMSELVES AND OLIVER P. SCAIFE, OF PITTSBURG, PENNSYLVANIA.

Letters Patent No. 95,686, dated October 12, 1869.

IMPROVED APPARATUS FOR HEATING PUDDLING-FURNACES.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that we, SAMUEL A. HILL and CHARLES F. THUMM, both of Oil City, in the county of Venango, and State of Pennsylvania, have invented a new and useful Improvement in Apparatus for Generating Heat in Puddling and other Furnaces; and we do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

The nature of our invention consists in the use of the apparatus hereinafter described, for mixing and combining with air or steam, or air and steam combined, a vapor or gas evolved from a liquid or solid that is susceptible of being transmuted into a vapor or gas, which will, when combined with air or steam, or air and steam combined, form an inflammable admixture of vaporous or gaseous matter, that may be burned in a furnace, as a substitute for fuel.

To enable others skilled in the art to make and use our invention, we will proceed to describe its construction and operation.

In the accompanying drawings, which form part of our specification—

Figure 1, Sheet A, is a vertical and longitudinal section of our improvement for generating heat in puddling and other furnaces.

Figure 2, Sheet A, is a side elevation of a puddling-furnace, and represents our improvement attached to it, and also represents the furnace used for evolving gaseous or vaporous matter, for mixing it with air or steam, by means of said apparatus.

Figure 3, Sheet B, is a longitudinal section of an ordinary puddling-furnace, and our improvement for generating heat in it.

In the accompanying drawings—

A' represents a puddling-furnace, with our improvement in apparatus for generating heat attached to it, which apparatus consists of chambers A and B, pipes C and D, and air-inlets *e* and *f*.

The pipe D should be attached to a steam-boiler or to a fan or blower, and the pipe C to a furnace, as indicated at B', or to other device which will evolve a liquid or a solid into a vapor or gas.

The chamber A should be constructed of fire-brick or other refractory material, which will resist the wasting-action of an intense heat.

As the construction of our improvement, and the manner of applying it to a furnace, will be readily understood by the skilful mechanic, by reference to the accompanying drawings, and from the foregoing description, we will, therefore, proceed to describe the operation, which is as follows:

We place wood, coal, or other solid matter which can be evolved into a gas or vapor, as hereinbefore described, in the furnace B', the stack *h* of which is provided with a damper, *x*'. We then fire the wood, coal, or other matter, as the case may be, and when it begins to burn freely, we then close down the damper *x*', as shown in fig. 3. We then open the valve *x* of pipe D, so that a current of steam or compressed air will flow through it into chamber B.

This current of air will draw the gas or vapor evolved in the furnace B', through pipe C, into the chamber B, and at the same time cause air to pass rapidly through the inlets *e* and *f* into the chamber B, where the whole become thoroughly mixed and commingled, so as to form one admixture of gaseous or vaporous matter, which passes into chamber A, where it is ignited and burns with vivid combustion, causing intense heat, which will act most efficiently upon the iron and other matter placed in the puddling-furnace A'.

The skilful mechanic will readily understand how vapors or gas evolved in a still or other device may be used and applied by means of our improved apparatus.

We are aware that gas and air have been combined and burned in furnaces for generating heat, and, therefore, we wish it clearly understood that we do not claim broadly the use of air, gas, or vapor, nor air, gas, vapor, or steam combined, and used in a furnace, for the purpose of generating heat.

Having thus described the nature, construction, and operation of our improvement,

What we claim as of our invention, is—

1. An apparatus for burning gaseous fuel or matter, said apparatus consisting of chambers A and B, pipes C and D, and air-inlets *e* and *f*, constructed, arranged, and operating substantially as herein described, and for the purpose set forth.

2. In combination with the above, a gas or exhalating-furnace or apparatus, for supplying the chambers A and B with gaseous fuel or matter for burning, as herein described.

3. Drawing the gaseous fuel or matter from a furnace or other apparatus, and then forcing it into chambers A and B, through the medium of compressed air, as herein described, and for the purpose set forth.

SAMUEL A. HILL.
CHAS. F. THUMM.

Witnesses:

JAMES J. JOHNSTON,
JOHN LOCKIE.