

Hill & Thum

Steam Generator.

Nº 95,688.

Patented Oct. 12, 1869.

Fig. 3.

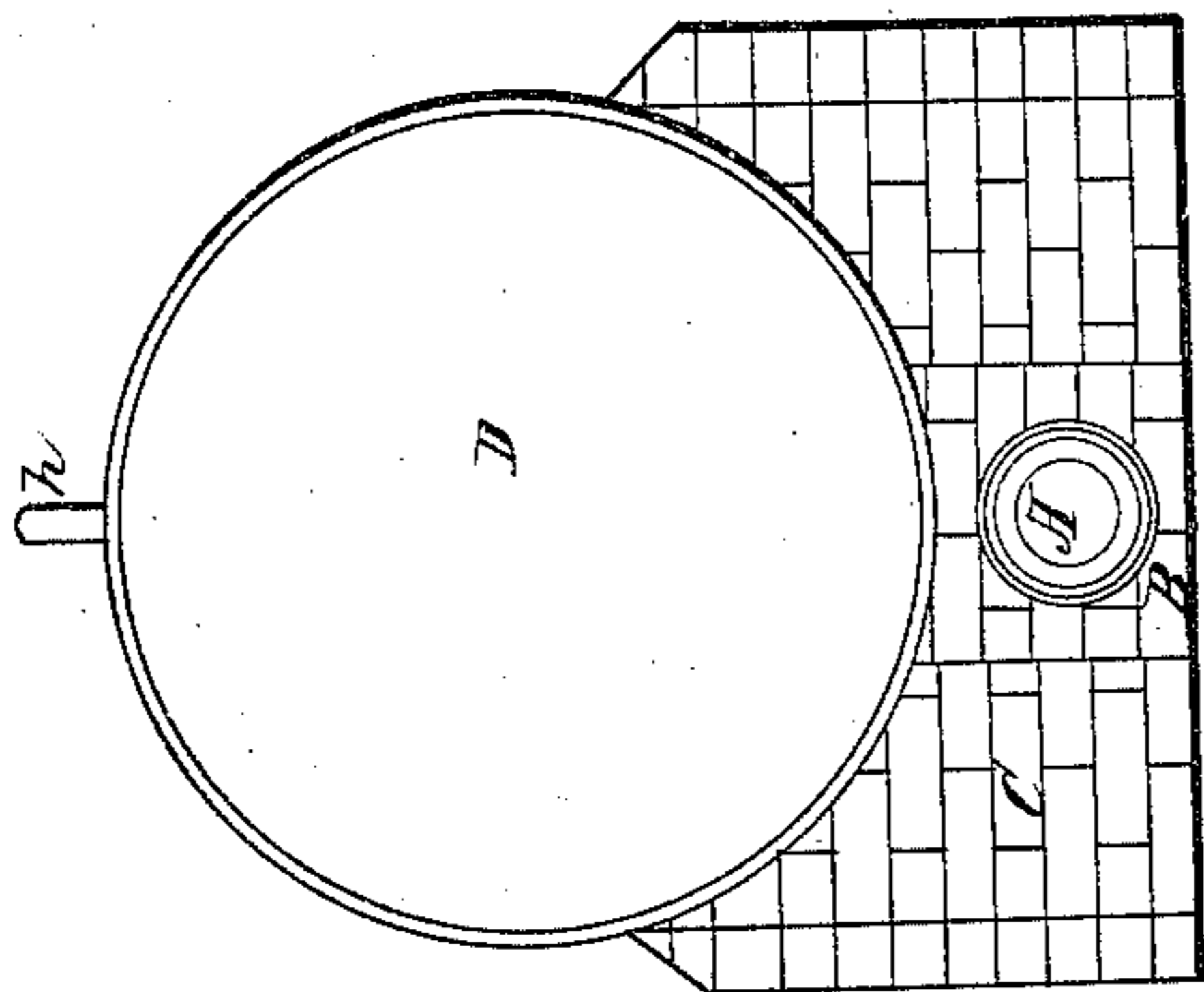


Fig. 1.

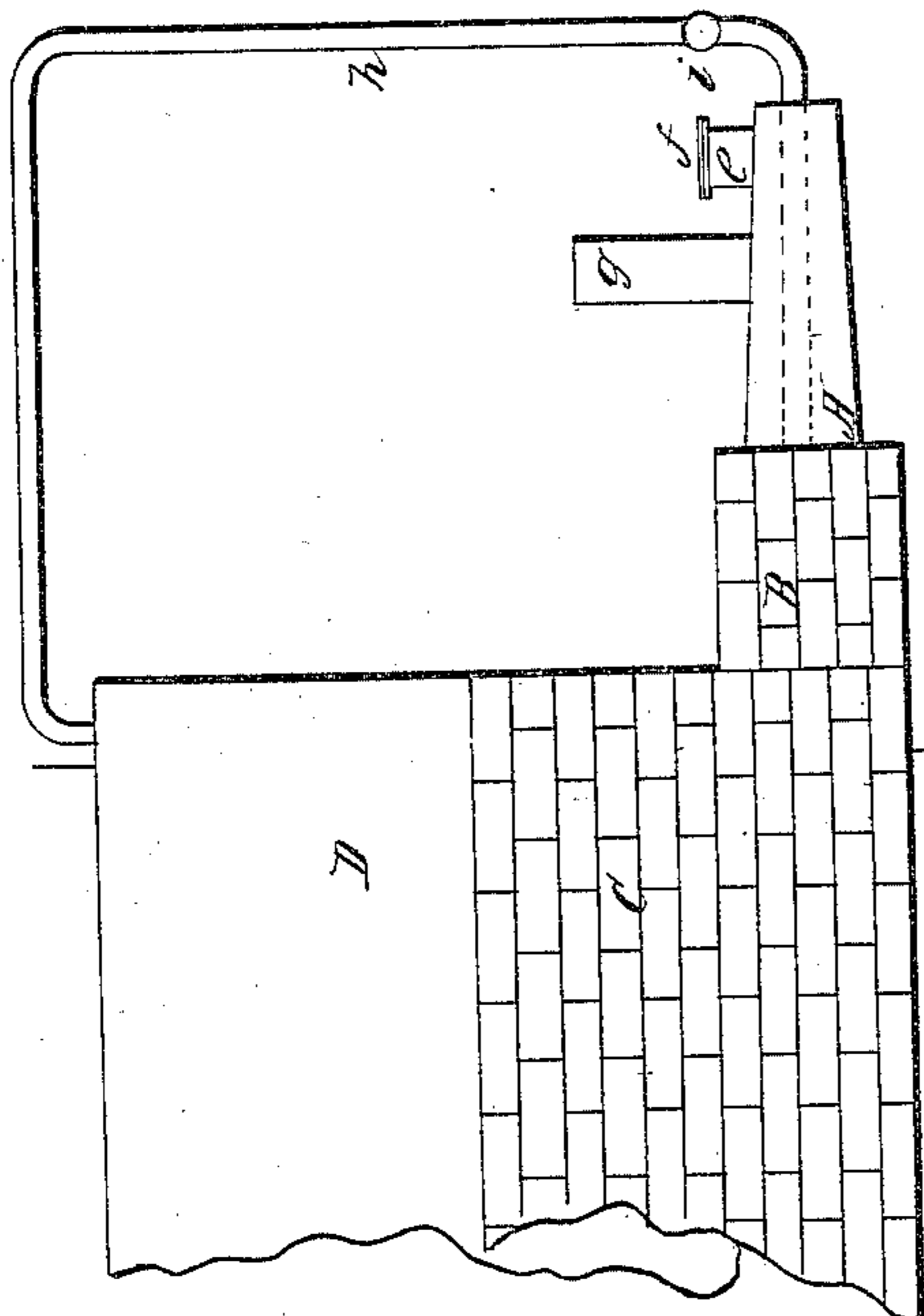
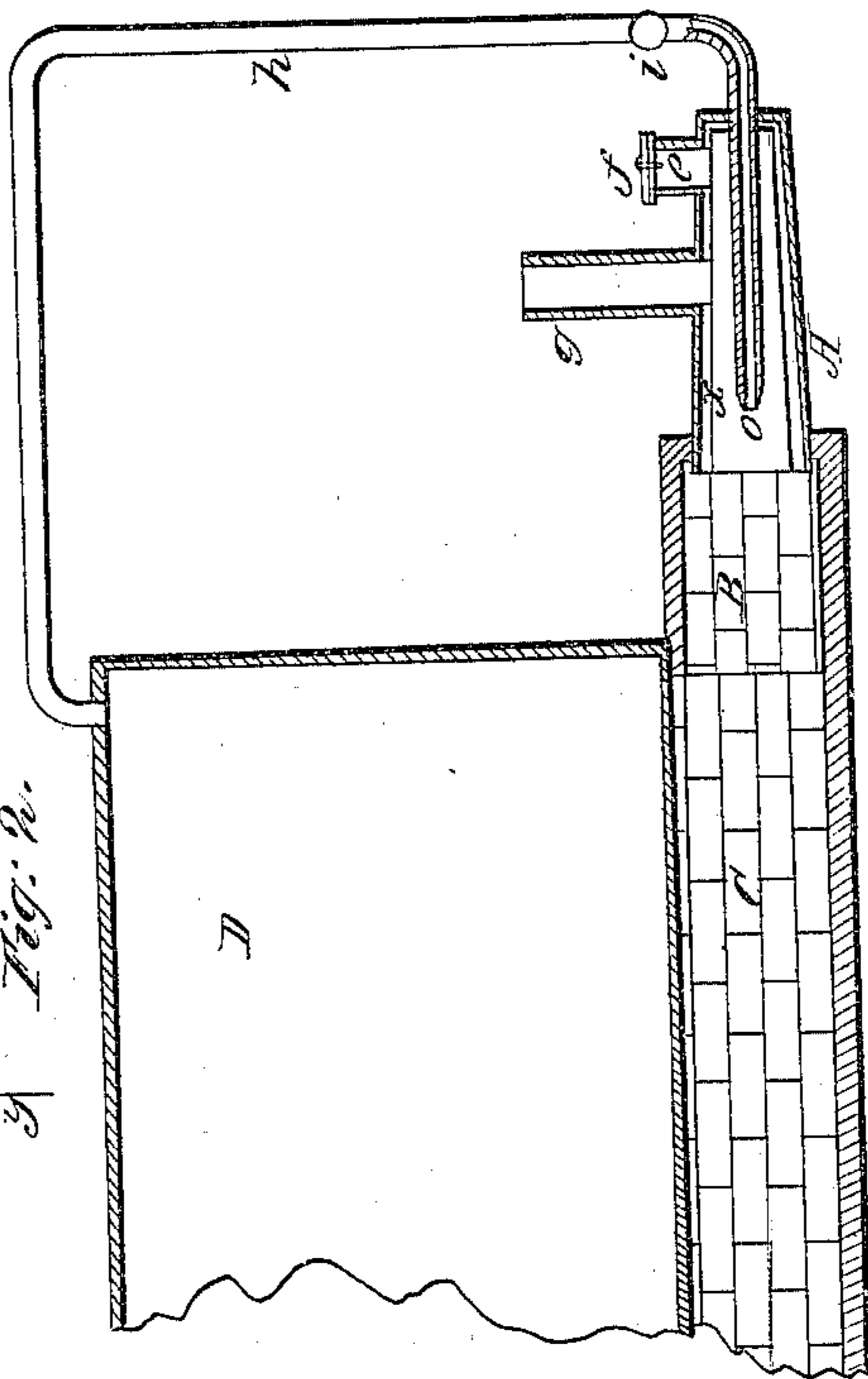


Fig. 2.



Witnesses
Geo. H. Thomas
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By their attorney J. C. Johnston

UNITED STATES PATENT OFFICE.

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

IMPROVED APPARATUS FOR GENERATING STEAM IN BOILERS.

Specification forming part of Letters Patent No. 95,688, dated October 12, 1869.

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 Steam; 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 so constructing the apparatus hereinafter described that hydrocarbon or other matter susceptible of vaporization may be mixed with an active current of air or steam, or air and steam combined, and burned under a boiler for generating steam.

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 is a side elevation of our improvement for generating steam. Fig. 2 is a longitudinal and vertical section of the same. Fig. 3 is a transverse section of the same when cut through at line *y*.

In the accompanying drawings, D represents an ordinary boiler used for generating steam. C represents the furnace for the boiler.

At the front end of the furnace is a fire-chamber, B, made of fire-brick or other refractory material. To the fire-chamber B is connected a metal chamber, A, which is lined with a suitable refractory matter, as indicated at *x*. The chamber A is provided with pipes *e*, *g*, and *h*. The pipe *e* is provided with a register, *f*, and the pipe *g* may be connected to a reservoir containing hydrocarbon oil or other liquid matter which can be vaporized; or it may be connected to a furnace for burning any of the known articles of fuel. The chamber A is also provided with a steam-pipe, *h*, which is connected to the upper side of the boiler D, and, passing along, enters the end of the chamber A, extending into it so that its outlet *o* is forward of the pipes *e* and *g*. The steam-pipe *h* is provided with a valve, *i*, for regulating the flow of steam into the chamber A.

As the construction and arrangement of the several parts of our improvement and the re-

lation of the parts to each other will be readily understood by the skillful mechanic by reference to the accompanying drawings, and from the foregoing description, therefore we will proceed to describe its operation, which is as follows: A fire is made in the furnace for the purpose of generating steam, and when the desired pressure of steam is obtained the valve *i* is opened so that steam will flow through the pipe *h*. The register *f* of pipe *e* is adjusted so as to admit the desired quantity of air. The pipe *g* being connected with a reservoir of oil, or with a furnace for burning coal, wood, or other matter, the steam will draw air into chamber A through the pipe *e*, and the hydrocarbon oil flowing through pipe *g* will become mixed with the current of air, and the admixture of air and oil coming in contact with the steam, the three elements—viz., air, oil, and steam—are so mixed and blended together as to form in chamber A a vaporous or gaseous body, which, being ignited at the inner end of chamber A, burns with vivid combustion and intense heat in chamber B, which heat passes under the boiler, thereby generating steam with great rapidity.

By attaching the pipe *g* to an oil-well, the gas in the well may be drawn into chamber A and mixed with the air and steam, and burned in chamber B; or the pipe *g* may be attached to a stove or furnace in which coal, wood, or other material is being burned, and the heat, smoke, and gas thus generated may be drawn into chamber A through pipe *g*, and mixed with the air and steam, and the whole consumed in chamber B.

Having thus described the nature, construction, and operation of our improvement, what we claim as of our invention is—

The apparatus herein described for generating steam by consuming hydrocarbon and other matter susceptible of evolution or vaporization, by commingling it in chambers A and B with an active current of steam or air, or active currents of steam and air combined, substantially as herein described.

SAMUEL A. HILL.
CHAS. F. THUMM.

Witnesses:

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