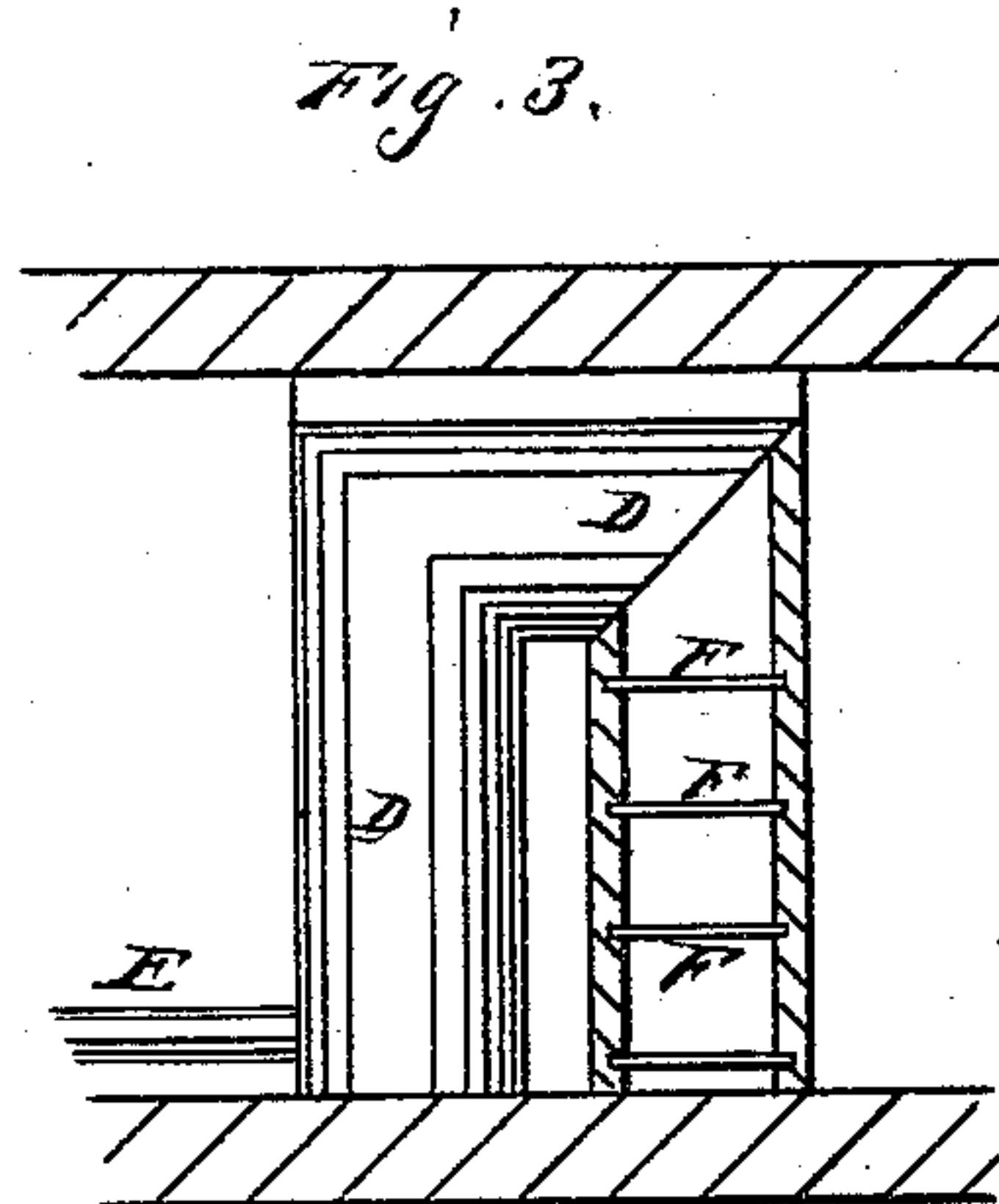
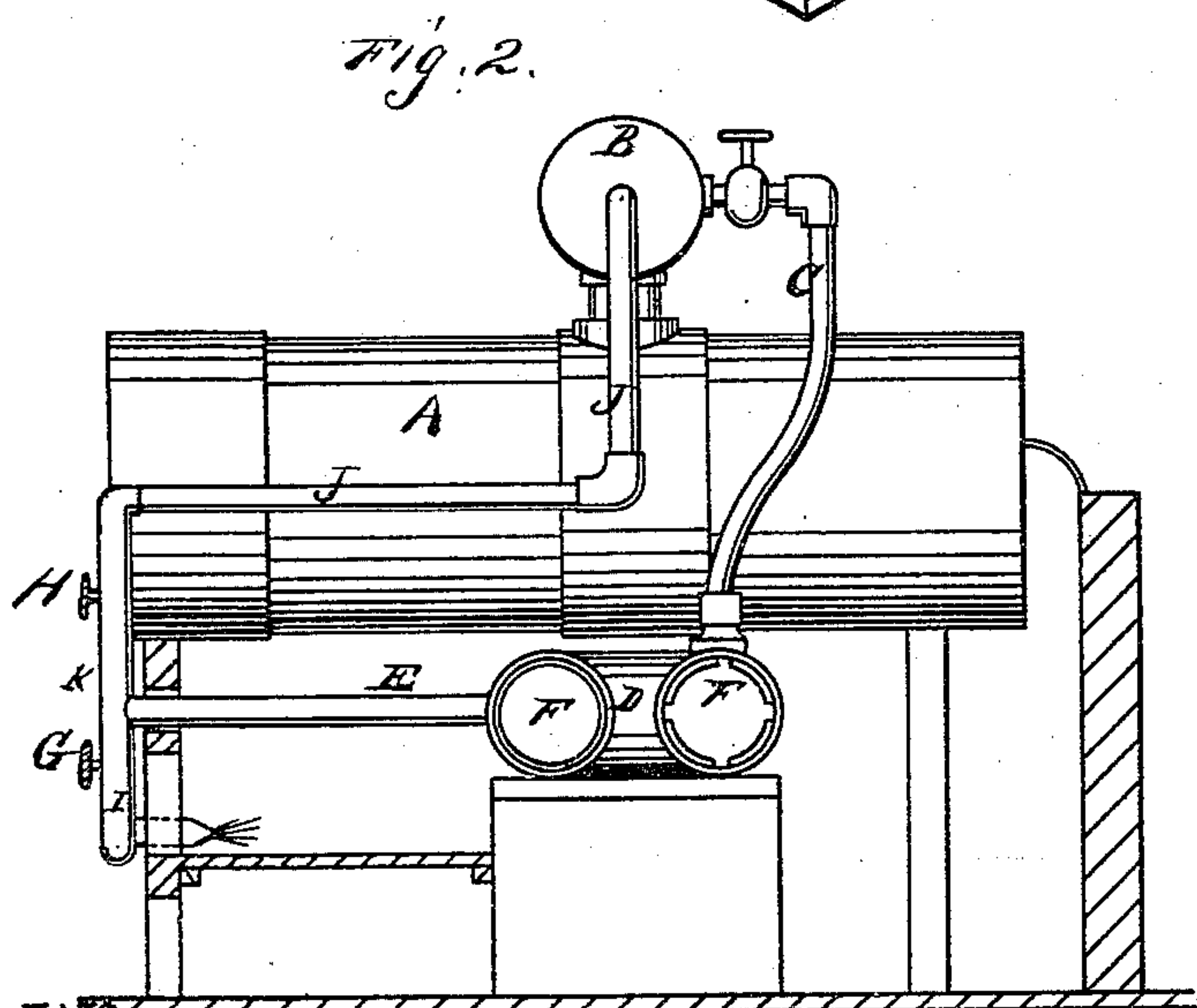
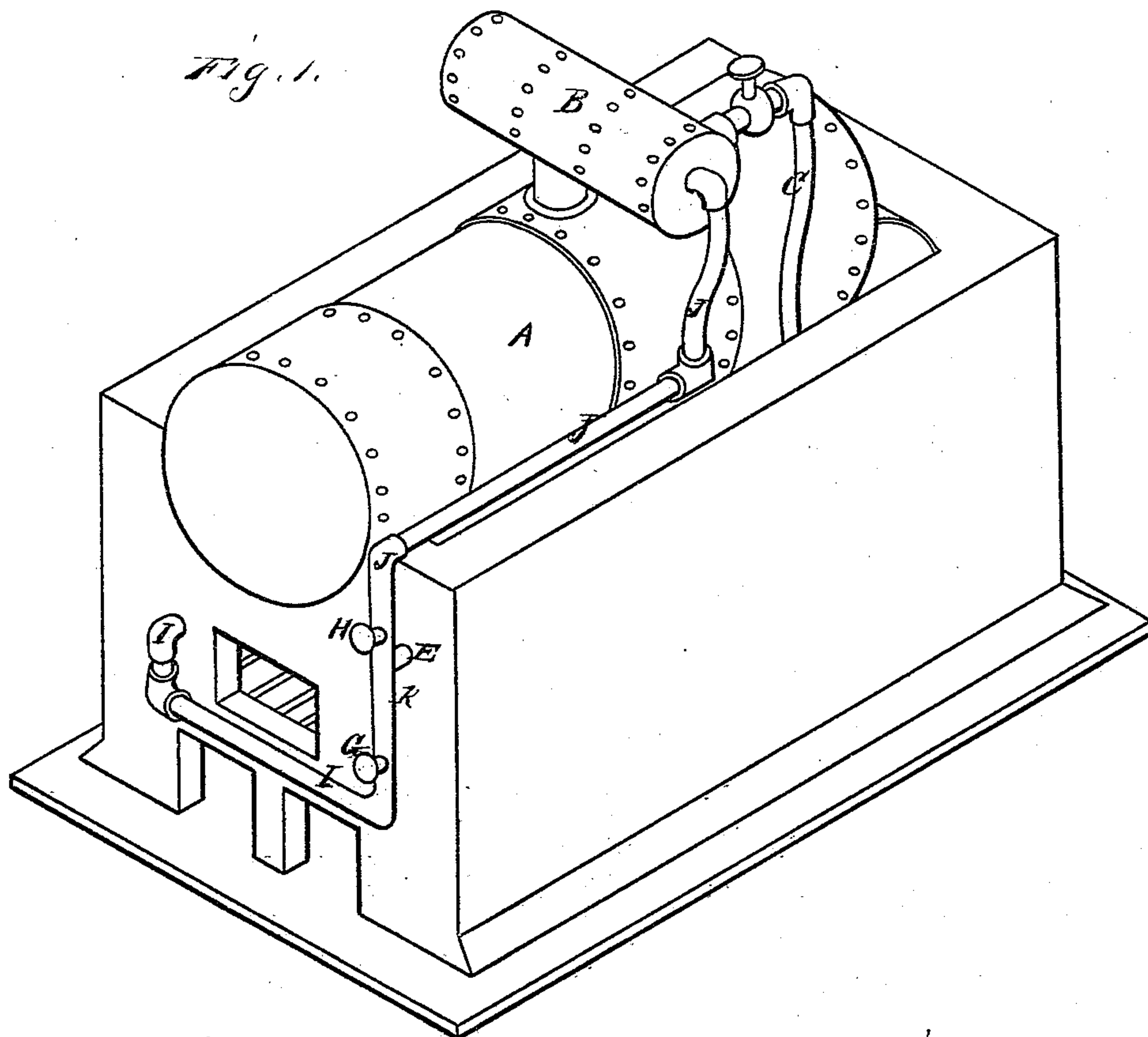


**G. W. COFFEE.**  
**Superheating Steam.**

No. 148,598.

Patented March 17, 1874.



**Witnesses**

John L. Boone  
C. Milton Richardson

# Inventor

George W Coffee  
by Dewey & Co  
attys



# UNITED STATES PATENT OFFICE.

GEORGE W. COFFEE, OF VIRGINIA CITY, NEVADA.

## IMPROVEMENT IN SUPERHEATING STEAM.

Specification forming part of Letters Patent No. 148,598, dated March 17, 1874; application filed January 20, 1874.

*To all whom it may concern:*

Be it known that I, GEO. W. COFFEE, of Virginia City, Storey county, State of Nevada, have invented an Improvement in Superheating Steam for Steam-Engines; and I do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use my said invention or improvement without further invention or experiment.

My invention relates to certain improvements in the superheating of steam, and its employment in the propulsion of steam-engines; and it consists, first, in the use of a superheater and a series of pipes, by which the wet steam is taken from the steam-drum, and, after passing through the superheater, is carried so that while one portion is discharged into the furnace, another portion is returned directly to the steam-drum, and mingled with the wet steam therein contained before it passes into the engine.

Referring to the accompanying drawing for a more complete explanation of my invention, Figure 1 is a perspective view of the boiler, showing my devices. Fig. 2 is a side elevation, with the wall of the furnace removed, and showing a section of the superheater. Fig. 3 is a view of the superheater, with a section of a part of it.

The boiler A is provided with the steam-drum B, and a pipe, C, leads from this drum down to the superheater D, which I shall so place that it will receive the heat from the furnace. For this purpose, I prefer to place it upon the bridge-wall behind the grate; and it may be made of suitable size, with one or more turns. The steam is received into one end from the pipe C, a cock regulating its flow, and passes out, at the other end, through the pipe E, which leads through the boiler-front, as shown.

In order to break up any regularity of flow which may happen, and thus expose all parts of the steam to the superheating influence of the exterior walls of the tube or chamber, I construct numerous diaphragms, F F, which are made with an annular opening around the

outside, as shown, so that all the steam will be obliged to pass through these openings in traversing the superheater, and thus be brought into contact with the hot surface of it.

By this device I am enabled to thoroughly superheat all the steam, which is then passed through the pipe E to the front of the boiler, where it enters a vertical pipe, K. Two cocks, G and H, are placed in this vertical pipe, one above, and one below, the pipe E, and these cocks determine the flow of superheated steam to the furnace and to the steam-drum. A pipe, I, passes along the boiler-front, and is provided with suitable jets, controlled by the cock G for discharging superheated steam into the furnace among the fuel—whether wood or coal be used—to assist in combustion. A pipe, J, which is opened and closed by the cock H, carries a portion of the superheated steam back to the drum B, where it is mingled with the wet steam already there, with the effect to partially dry and superheat the whole before it passes to the engine.

By thus superheating the steam I am enabled to greatly decrease the quantity of fuel necessary, and to run my engine much more economically.

When employed upon locomotive-engines, it will be found useful to carry a pipe forward, so as to discharge superheated steam upon the rails in front of the drivers, to dry and cleanse them when wet from fog or rain, or dirty from the drippings of oil from the engine, and thus prevent the slipping of the drivers with heavy trains.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

In combination with the superheater D, as shown, the branch pipes I and J, leading, respectively, to the furnace and the steam-drum, substantially as and for the purpose set forth.

In witness whereof I hereunto set my hand and seal.

GEORGE WAYNE COFFEE. [L. S.]

Witnesses:

JOHN L. BOONE,

C. MILTON RICHARDSON.