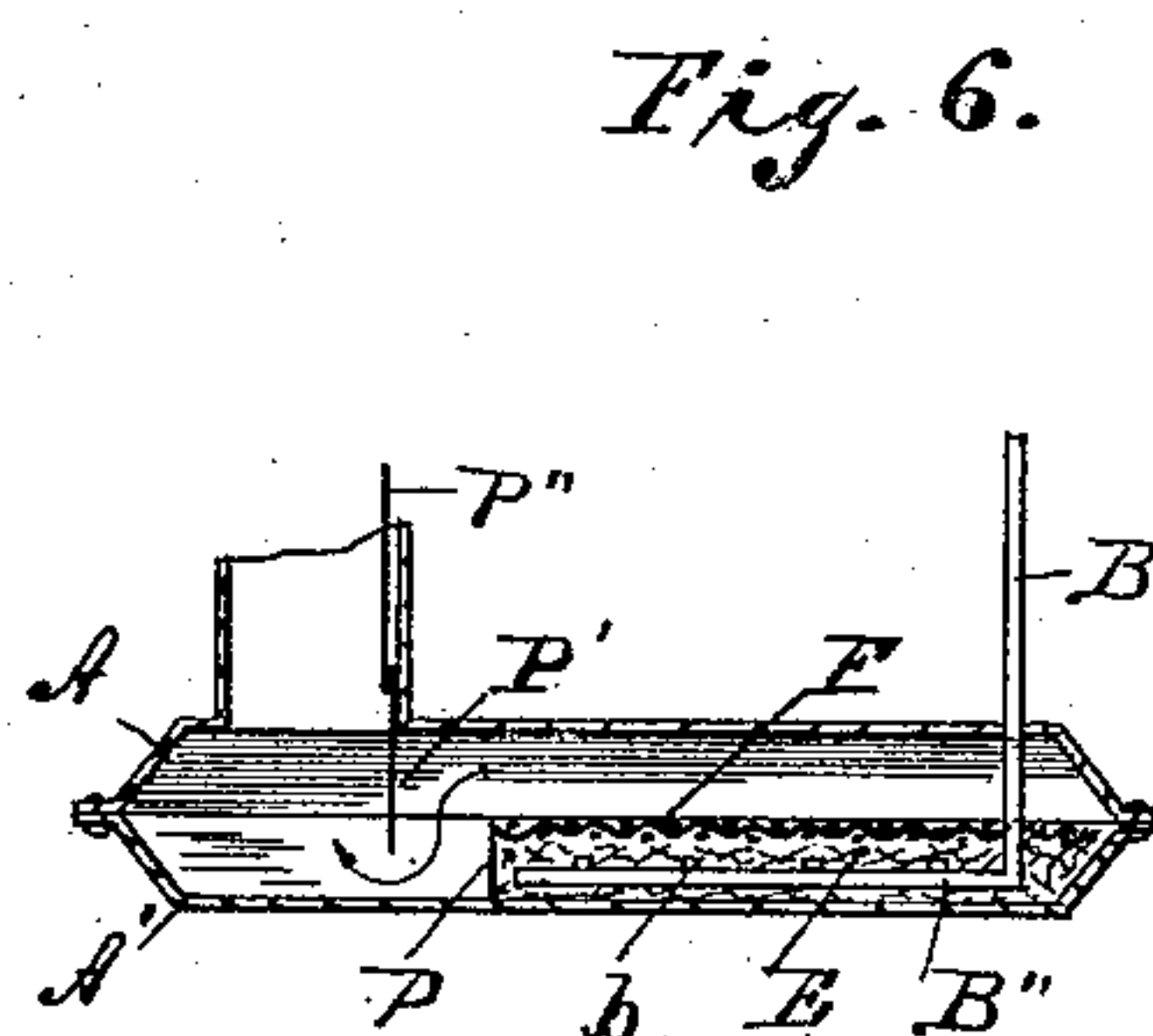
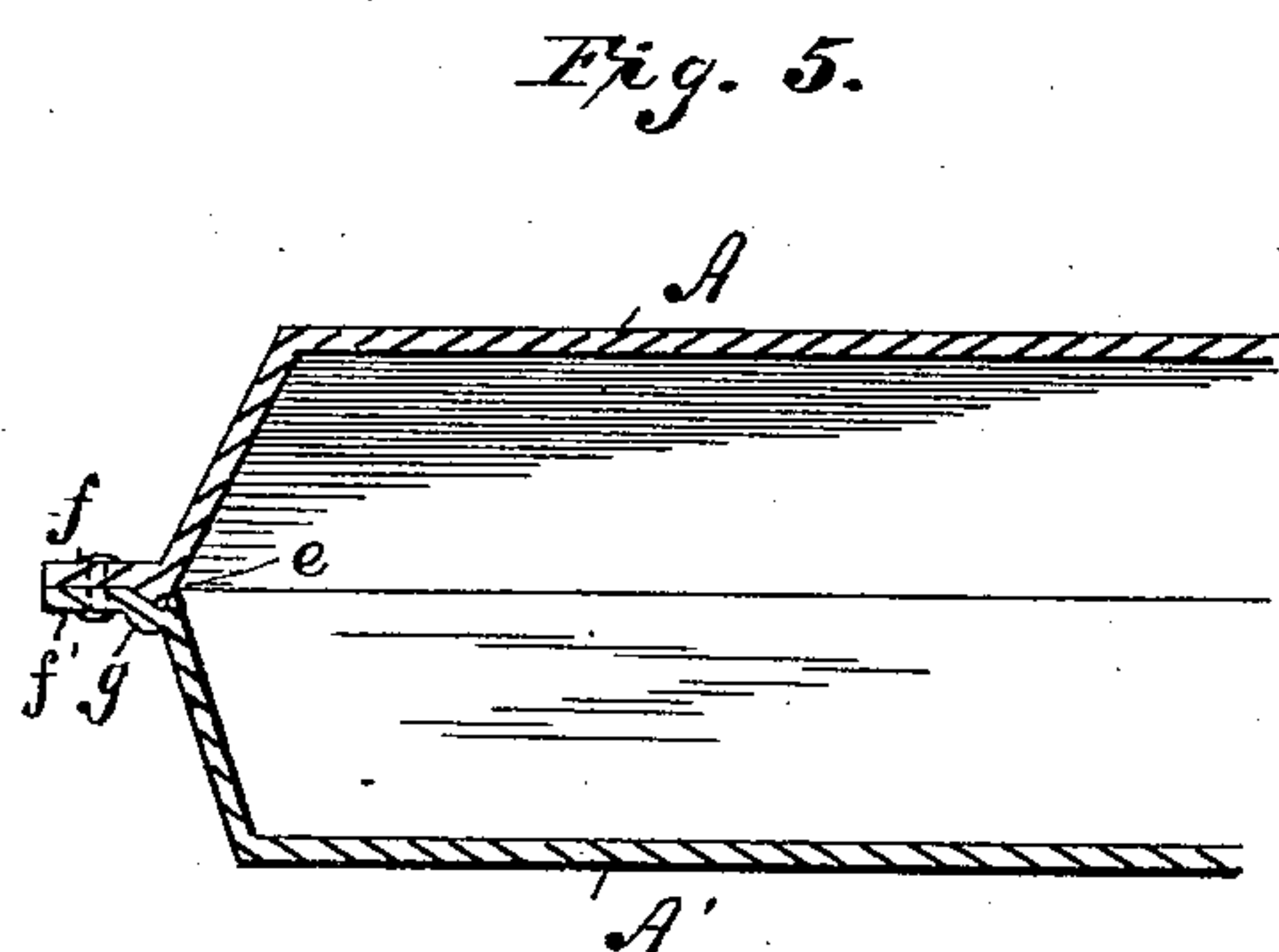
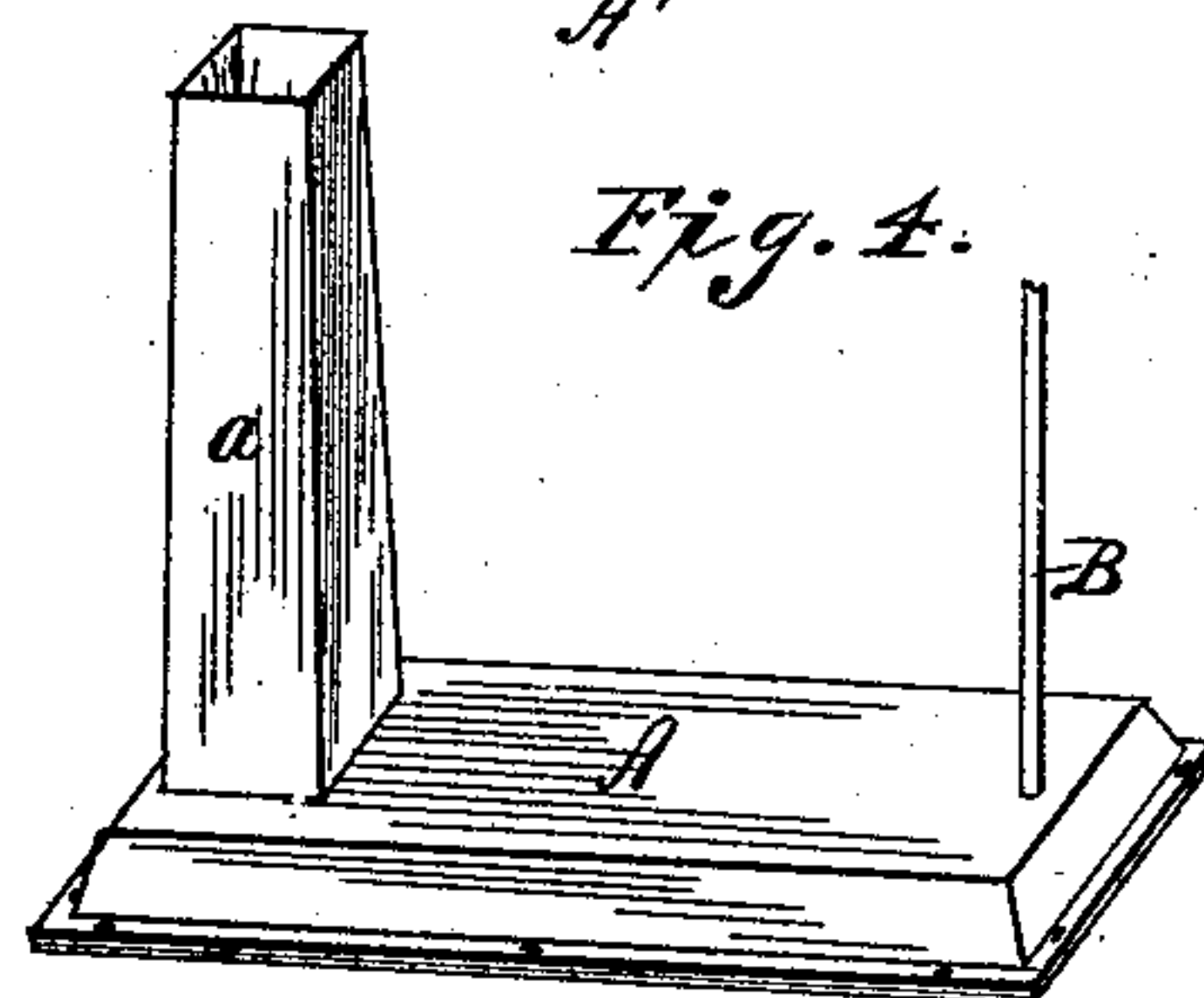
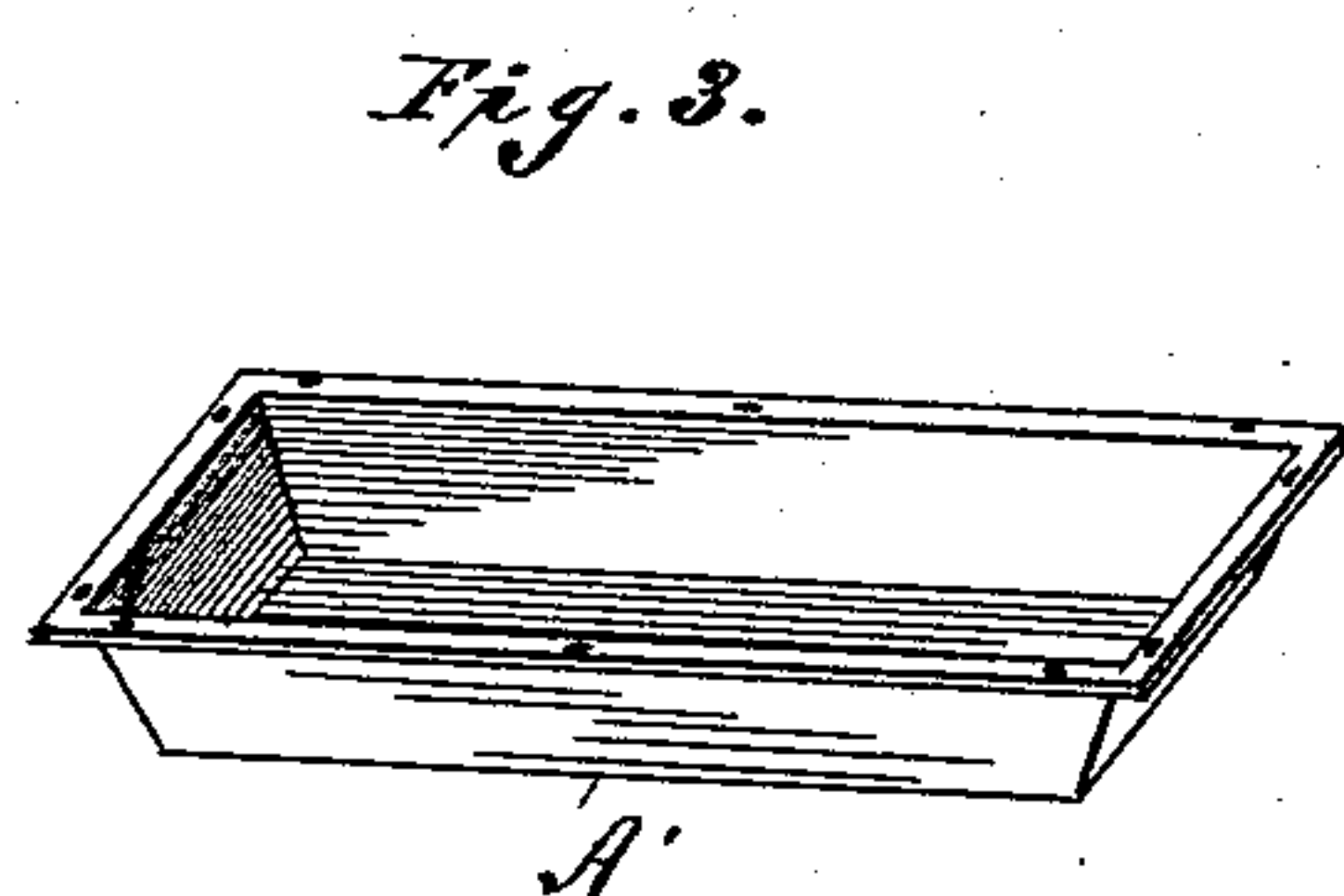
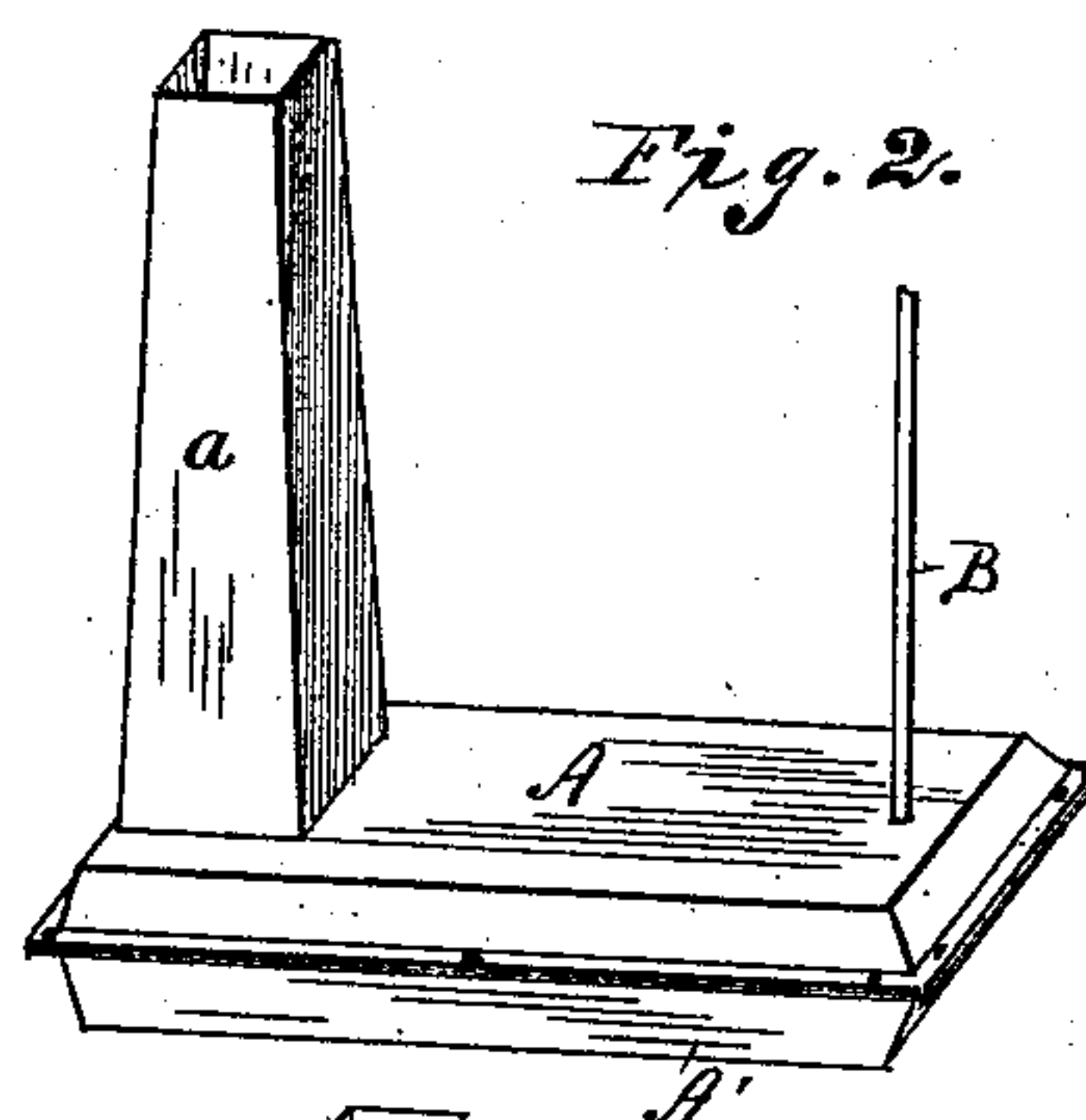
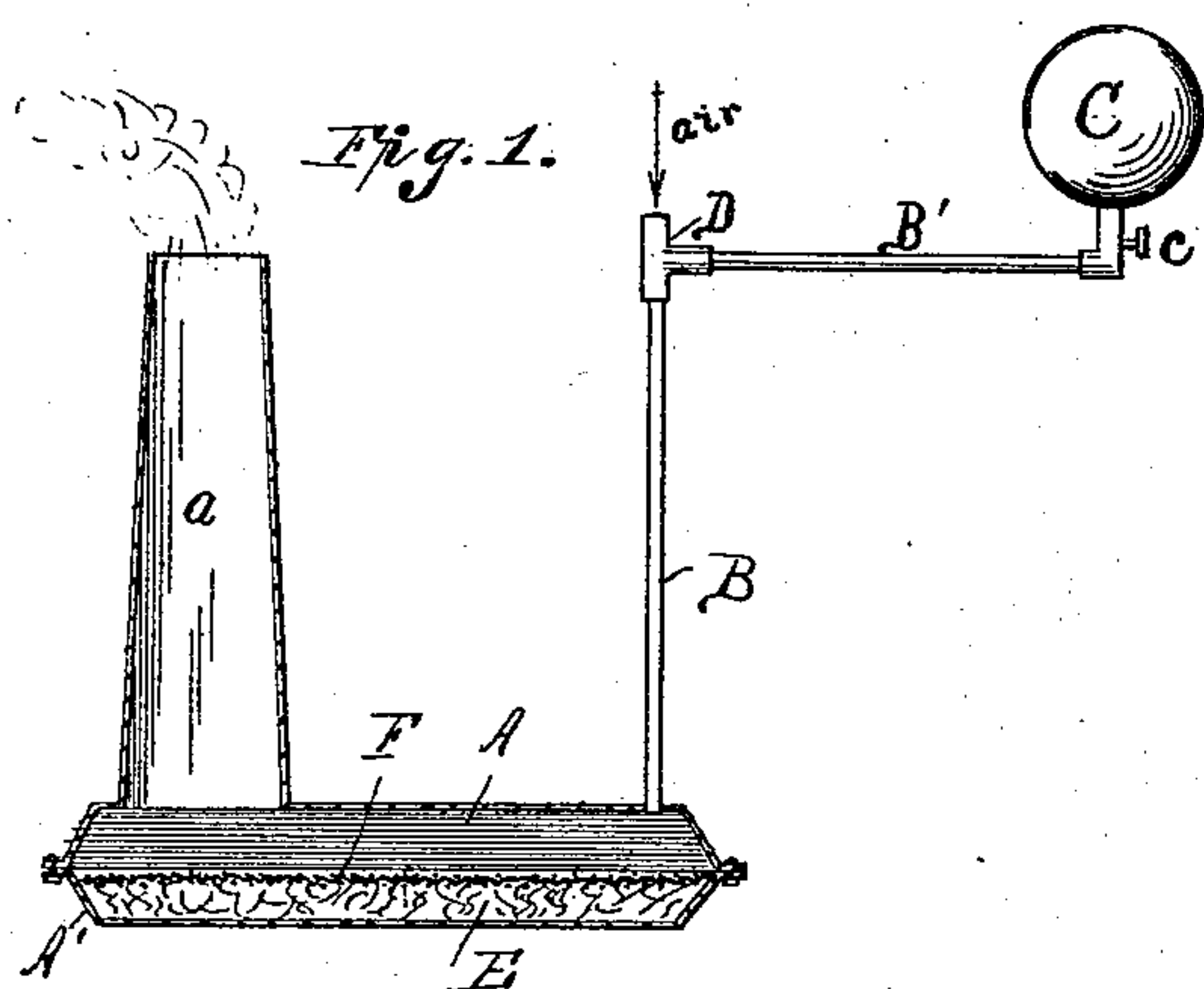


(No Model.)

J. T. McGRATH.
TANK HEATER.

No. 472,798.

Patented Apr. 12, 1892.



Witnesses:
E. N. Berry.
H. P. Wiers.

Inventor:
John T. McGrath,
By Miles Greene,
Attys.

UNITED STATES PATENT OFFICE.

JOHN T. McGRATH, OF PALMYRA, ILLINOIS.

TANK-HEATER.

SPECIFICATION forming part of Letters Patent No. 472,798, dated April 12, 1892.

Application filed March 26, 1891. Serial No. 386,524. (No model.)

To all whom it may concern:

Be it known that I, JOHN T. McGRATH, a resident of Palmyra, in the county of Lee and State of Illinois, have invented certain new and useful Improvements in Tank-Heaters; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to improvements in submerged tank-heaters of the class adapted to burn liquid fuel, such as gasoline, kerosene, or other hydrocarbons.

The invention is fully described and explained in this specification and shown in the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of my improved heater. Fig. 2 is a perspective view thereof. Fig. 3 is a perspective view of the lower section of the heater. Fig. 4 is a similar view of the upper section thereof. Fig. 5 is a section illustrating a preferred method of securing the sections together. Fig. 6 is a section of a modified form of my heater.

In the views, A A' are two sections of any suitable form resting one upon the other and so secured together as to form a single watertight chamber. The meeting edges of the two sections may be so formed and packed as to make a tight joint in any desired manner; but I prefer the construction shown in Fig. 5, in which the upper section A is formed with a horizontal flange *f* and a dependent lip *l*, the flange being supported by a corresponding flange *f'* on the lower section and the lips being received by a groove *g* in the inner margin of the said flange. The groove may be packed with any fire-proof cement for the purpose of making a tight joint, and the two sections when connected are to all intents and purposes a single structure. The upper section A is provided with an integrally-formed upwardly-extending smoke-stack *a* and a vertical tube B for the introduction of liquid fuel and the admission of air, and a reservoir C is connected with the vertical tube by means of a horizontal tube B', the two tubes being united at their meeting-point by a T D, adapted to permit the passage of both air and fluid fuel.

On the bottom of the lower section A' of the

combustion-chamber is a layer E of porous non-combustible material, preferably asbestos, and this is covered and protected by a sheet of perforated metal or wire-gauze F. Liquid fuel admitted to the chamber by means of the tubes B B' saturates the layer E, which serves as a wick, and after such saturation the oil may be burned by applying a light to the surface of the saturated material. The flow of fuel may be regulated by means of a cock *c*, situated in the tube B', and the rate of combustion thus increased or decreased at will, and the vertical tube B' supplies air necessary to maintain the flame, while the smoke-stack *a* carries off the products of combustion as fast as formed.

In practice the heater is placed in a tank containing water, the water-line being at any level below the top of the smoke-stack and air-tube and the combustion-chamber being wholly submerged. This gives the heat generated by the combustion the greatest possible effect, as it is practically applied to the water from below, and as the combustion takes place over a comparatively large surface a very high heat may be produced when it is desired to raise the temperature of the contents of the tank quickly.

In Fig. 6 is illustrated a form of my device in which the layer of non-combustible material or wick is not extended under the smoke-stack, but is confined in a smaller space, formed by attaching a partition *p* to the lower section of the chamber. This forces the flame and products of combustion to move laterally a short distance before reaching the stack, and the effect thus produced may be increased by attaching a dependent deflecting-plate *p'* to the upper section of the chamber, as shown. This figure also shows a branch B'' formed on the lower end of the tube B and extending through the layer of porous material from end to end, the branch being provided with upwardly-extending nipples *b* for feeding the liquid fuel to various points near the upper surface of the absorbent layer.

The form of my device may be varied in many particulars, and I desire, therefore, not to limit the invention to the precise structures shown and described, though these fully illustrate the nature and objects of my invention.

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

1. In a submerged heater, the combination, with a water-tight combustion-chamber having an asbestos layer upon its bottom, of a single upwardly-extending tube opening within the chamber above said layer and having above the water-line an open-air branch and a branch leading to an oil-receptacle, the latter branch being provided with a stop-cock, substantially as and for the purpose set forth.

2. In a submerged heater, the combination, with a water-tight combustion-chamber having at one end a smoke-stack and at the other an internal upwardly-open compartment con-

taining asbestos, of a single tube entering said chamber above said compartment to supply both air and oil, and a deflector depending from the top of the chamber near the smoke-stack, whereby the flame first striking the top of the chamber is then thrown against the bottom thereof as it passes to the stack, substantially as set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

JOHN T. McGRATH.

Witnesses:

R. H. WILES,
JAMES H. STEARNS.