

F. Cook,

2 Sheets. Sheet 1.

Burning Hydrocarbon.

N^o 68,704.

Patented Sep. 10, 1867.

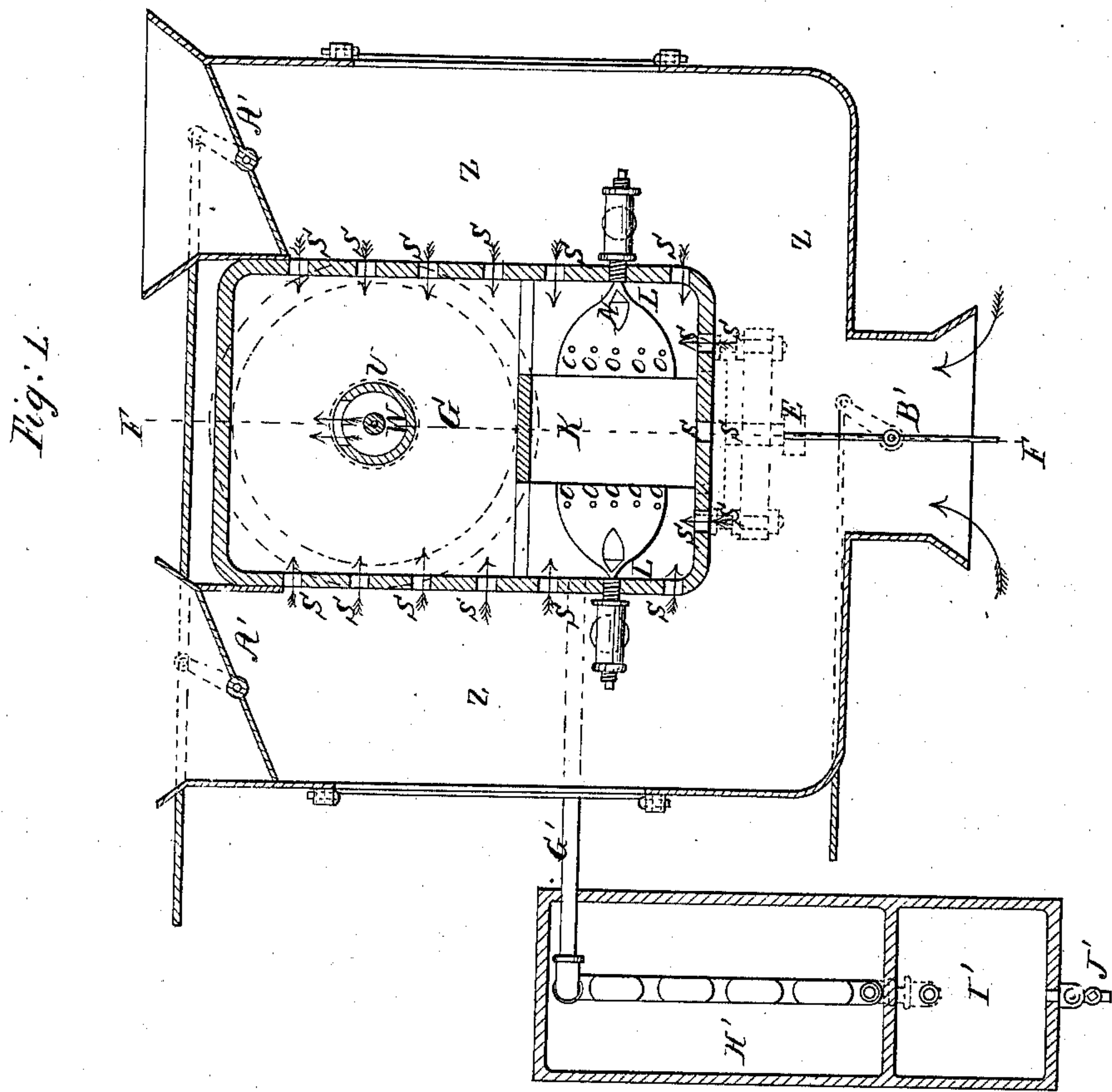


Fig. 4.

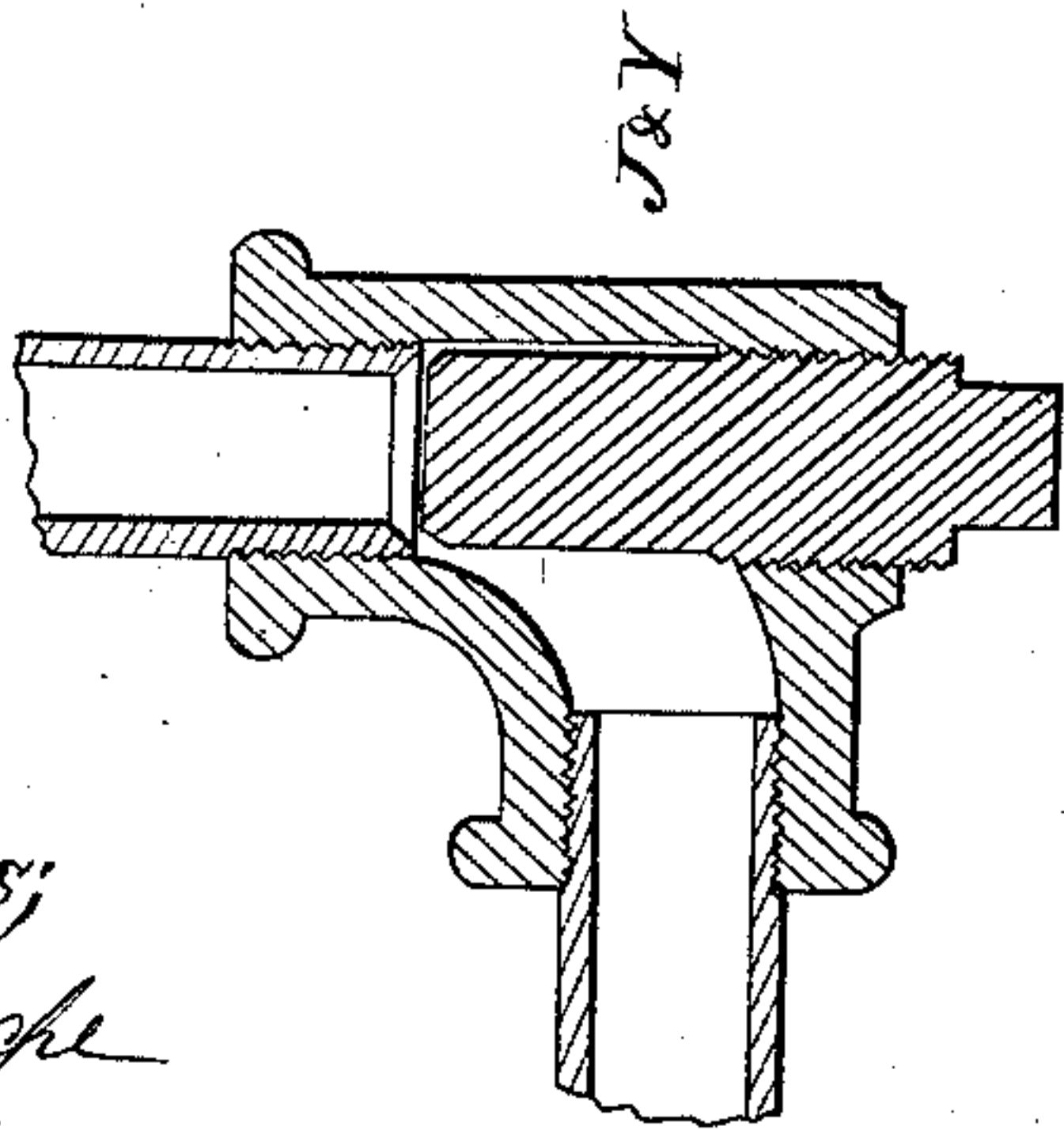
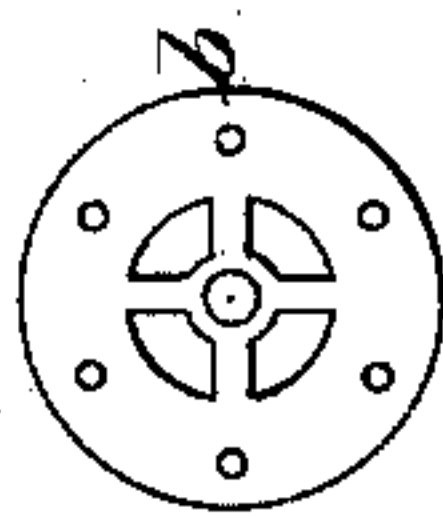


Fig. 5.



Witnesses;
Theo. Inoche
Wm. Truwin

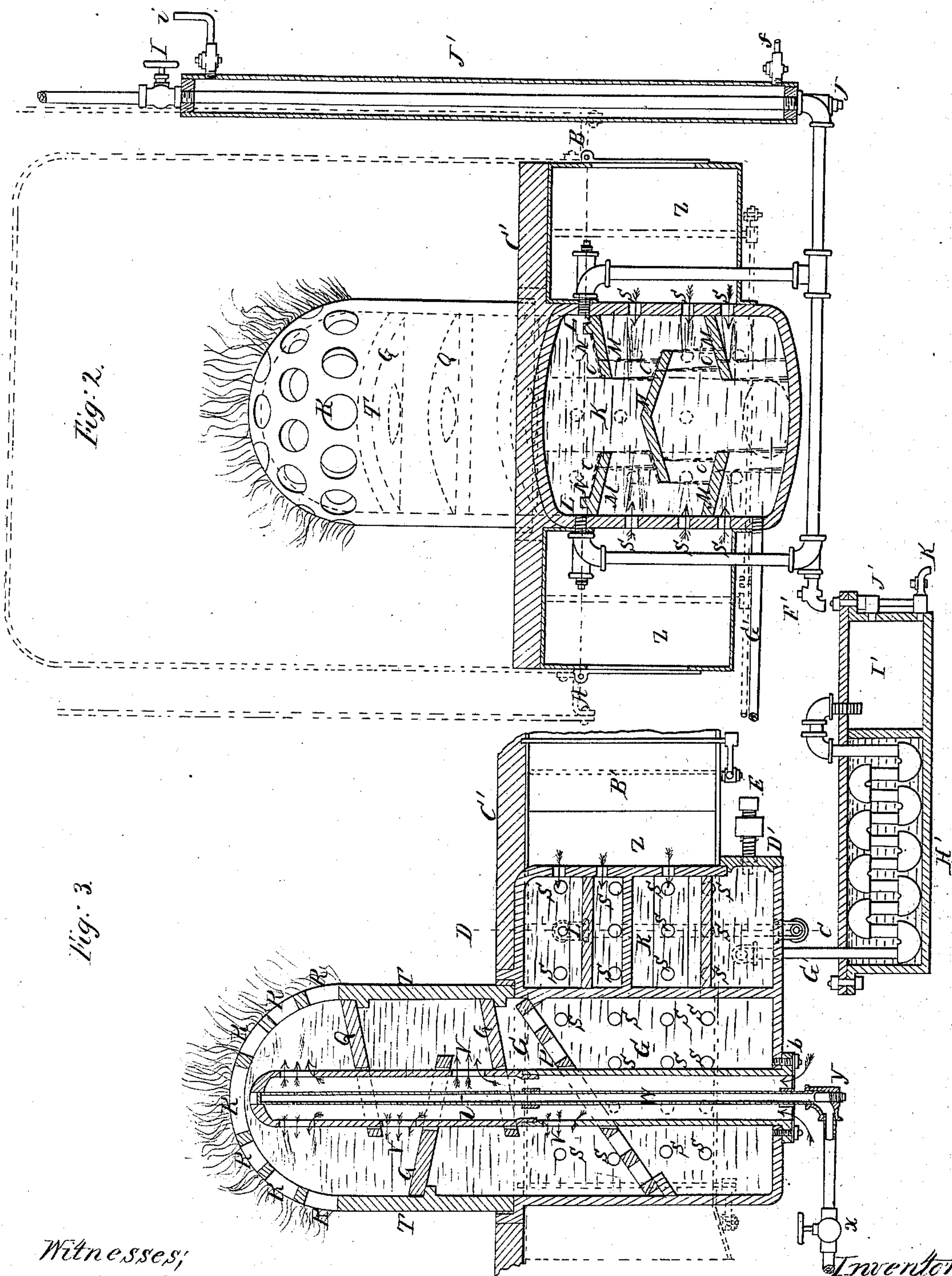
Inventor;
Fred. Cook
Per Munnell &
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Witnesses;
 Theo. Truett
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United States Patent Office.

FREDERIC COOK, OF NEW YORK, N. Y.

Letters Patent No. 68,704, dated September 10, 1867.

IMPROVED APPARATUS FOR BURNING PETROLEUM AND FLUIDS MADE THEREFROM.

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

TO ALL WHOM IT MAY CONCERN:

Be it known that I, FREDERIC COOK, of the city, county, and State of New York, have invented a new and improved Apparatus for Burning Petroleum and Fluids made therefrom; and I do hereby declare that the following is a full, 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 this specification, in which—

Figure 1 is a horizontal section through the line A B of fig. 2.

Figure 2 is a vertical section through the line C D of fig. 3.

Figure 3 is a vertical section through the line E F of fig. 1.

Figure 4 is an enlarged view of elbow, seen at J, fig. 2, and at Y, fig. 3.

Figure 5 is a face view of disk-plate, seen at b, fig. 3.

Similar letters of reference indicate like parts.

The object of this invention is to provide an apparatus by which petroleum and other fluids made from it may be safely and economically used as fuel in the generation of steam, or for other purposes; and my invention consists in the arrangement of a retort in connection with oil-conductors and air and steam tubes and apertures, shelves, and deflectors, whereby I am enabled to produce a more perfect and economical combustion of the liquid than has ever been obtained before, as I will proceed to describe.

G represents the retort, and K the drip-chamber, which forms a part and is connected therewith, into which the petroleum is first introduced and ignited. The petroleum or other liquid is conveyed from a reservoir, which is situated above the retort, by the pipe H, and is introduced into the drip-chamber on opposite sides, as seen in the drawing. The oil-supply pipe H passes through another pipe, J', into which steam from the boiler is introduced through the steam pipe i. This is for the purpose of raising the temperature of the oil before it is introduced into the drip-chamber or retort. f is a cock for drawing off the water of condensation. At the lower end or elbow of the pipe H there is a screw-valve, seen in section in fig. 4, by which the quantity of fluid to be discharged into the drip-chamber is regulated. The upper portion of the pipe H has a stop-cock, I, which may serve the same or a similar purpose when desired. The oil enters the drip-chamber K at L L, and flows from the oil pipe on to shelves M, which are the two uppermost of a series of inclined shelves. These two upper shelves have wedge-shaped projections N, which receive the oil and spread it into a thin sheet, as seen in fig. 1. The oil flows from these shelves on to the shelves below, and is ignited in this chamber. There are holes in these shelves, through which a portion of the oil passes in its descent, as seen in the drawing. S indicates apertures in the walls of the drip-chamber K, and also in the retort, for the passage of atmospheric air, as indicated by the arrows. Z Z are air-chambers, upon each side of the chamber K, and B' represents dampers to regulate the current of air. There are doors on each side leading into these air-chambers marked A'. The dampers are so arranged that they are at all times under the control of the engineer. The current of flame is raised by the motion of the locomotive, or by the natural ascent of the heated and expanded gases, or by any other means, into the retort G from the drip-chamber, and strikes an inclined perforated plate, P, through which it passes, and in its upward course it strikes other plates or deflectors, Q, which retard it sufficiently for the heated gases and products of combustion to become thoroughly mingled with the currents of air and steam which are discharged from the central vertical tube U and the pipe W. This tube U is an air-tube, which passes from the base to near the top of the dome of the retort, as seen. It is formed of iron, or other incombustible material, and is open at its lower end for the admission of air. Within this air-tube is a central steam pipe, W, and where the air-tube is perforated for the escape of a current of air there is an aperture directly opposite through the steam pipe for the escape of a jet of steam, which mingles with the air, and both mingle with the products of combustion, thus affording a large additional supply of oxygen to the flame, and causing thereby a much more perfect combustion than has hitherto been produced. The flame passes through apertures R in the top of the dome T to the steam-boiler above. Y is a screw-valve, by which the quantity of steam used is regulated. X is a steam-cock. The steam may be taken directly from the boiler, or it may be superheated before being used, as described, as may be deemed most convenient or economical. C' is a fire-brick or iron-plate hearth or covering for the chamber K for the protection of the oil-supply pipe, and to prevent any air from entering the fire-box of boiler, except through the air-passages S. G is an

overflow pipe, which conducts the overflow of oil, should there be any, into the cooler H, which cooler is filled with water. By passing the heated oil, which might accumulate in the bottom of the drip-chamber, through the worm pipe in the cooler it becomes cool, and is discharged into the compartment I, from whence it is drawn off through the faucet K. This arrangement is for the purpose of preventing danger from fire from the heated oil. J' is a glass gauge, which is placed within sight of the engineer, which shows him if there is any overflow in the retort or drip-chamber. F' is a faucet, through which the oil which remains in the feed pipes may be drawn off. The plate b, fig. 5, is attached to the bottom of the retort by screws, or in any other substantial manner, and supports the air-tube U and steam pipe W. D' is a hand-hole plate, secured by brace and bolt E to the drip-chamber, by the removal of which access is obtained to the drip-chamber for the purpose of cleaning, &c.

The chamber K and the retort G, with the dome T, are constructed of any desired size, and of any suitable materials. I do not confine myself to any particular form of retort or air-chambers, nor to any particular materials for the construction of any portion of the apparatus.

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

I claim the use of plates and deflectors, or either of them, within the retort, thereby forming compartments therein for the purpose of retarding the flame and producing a more perfect combustion.

The use of retorts having perforations for the admission of air, in combination with the flats or compartments, substantially as described for the purposes set forth.

I claim the construction and arrangement of the oil-supply pipe H with its connections, the cooler H', and the regulating valves J Y, substantially as described.

I claim protecting the oil-feeding pipes and apparatus from the heat of the furnace by the fire-clay tile, or other suitable material, substantially as described.

I claim the general construction of the apparatus described and shown.

FREDERIC COOK.

Witnesses:

JOHN McNEIL,

H. G. BARNUM.