

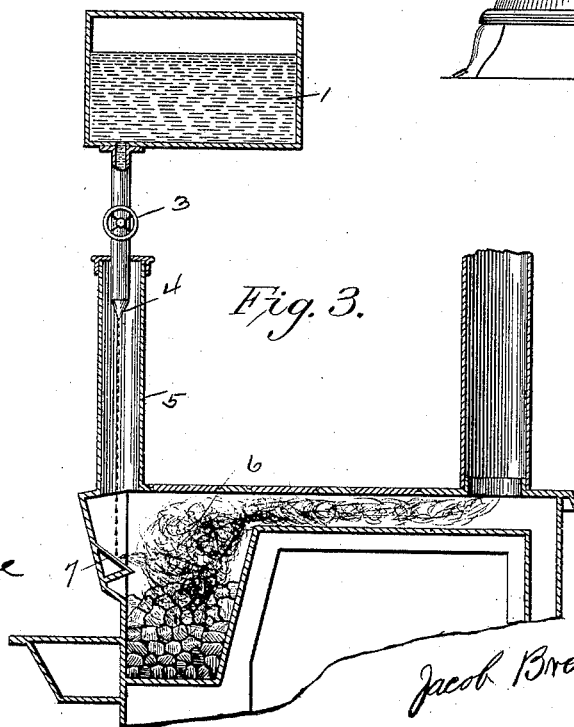
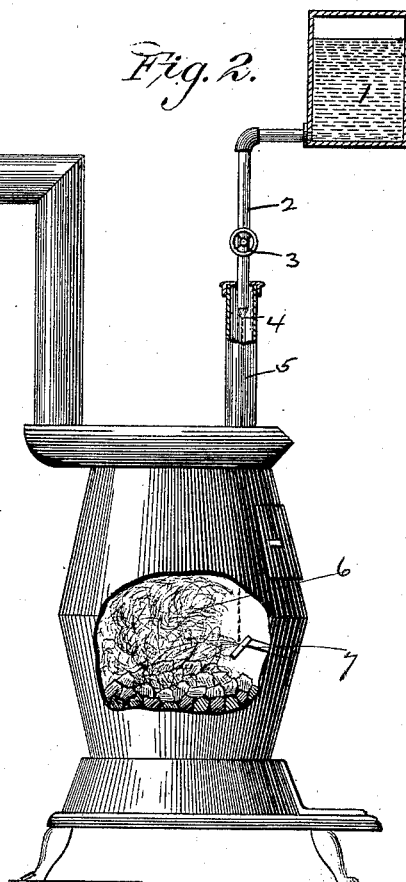
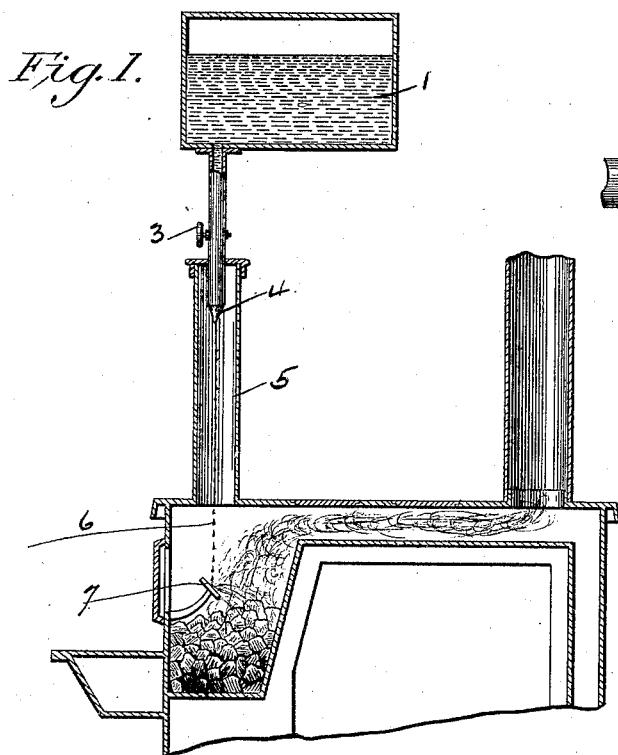
(No Model.)

3 Sheets—Sheet 1.

J. B. HOUGH.
APPARATUS FOR BURNING LIQUID FUEL.

No. 422,884.

Patented Mar. 4, 1890.



Witnesses:
A. McLane
J. A. Woolley

Inventor.

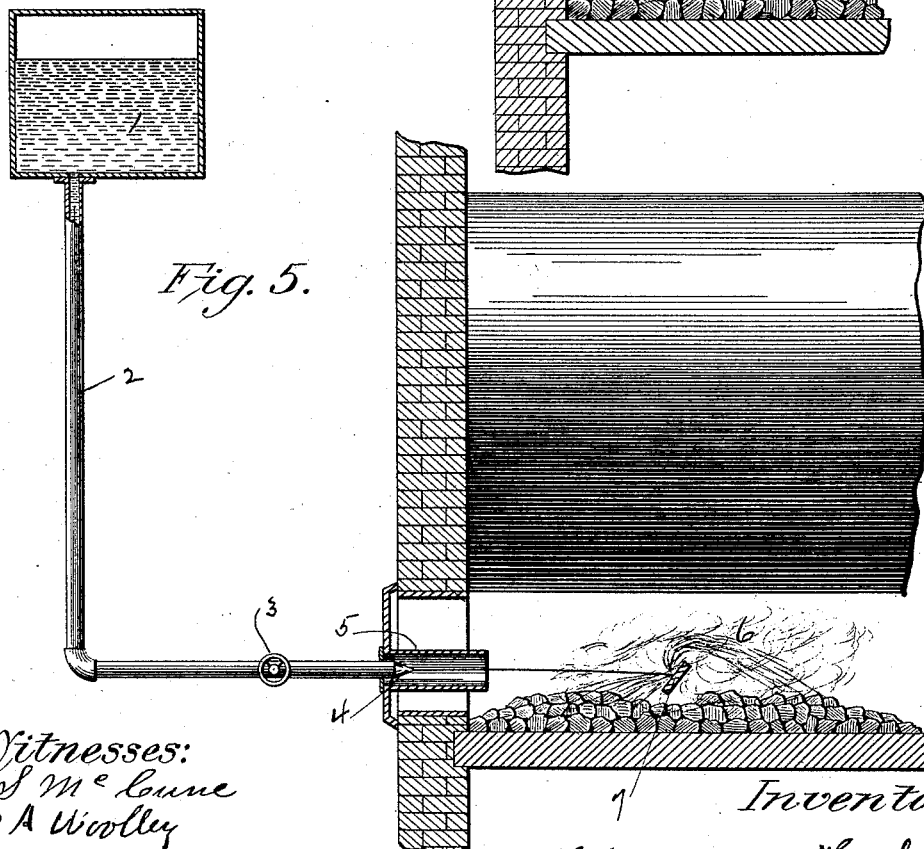
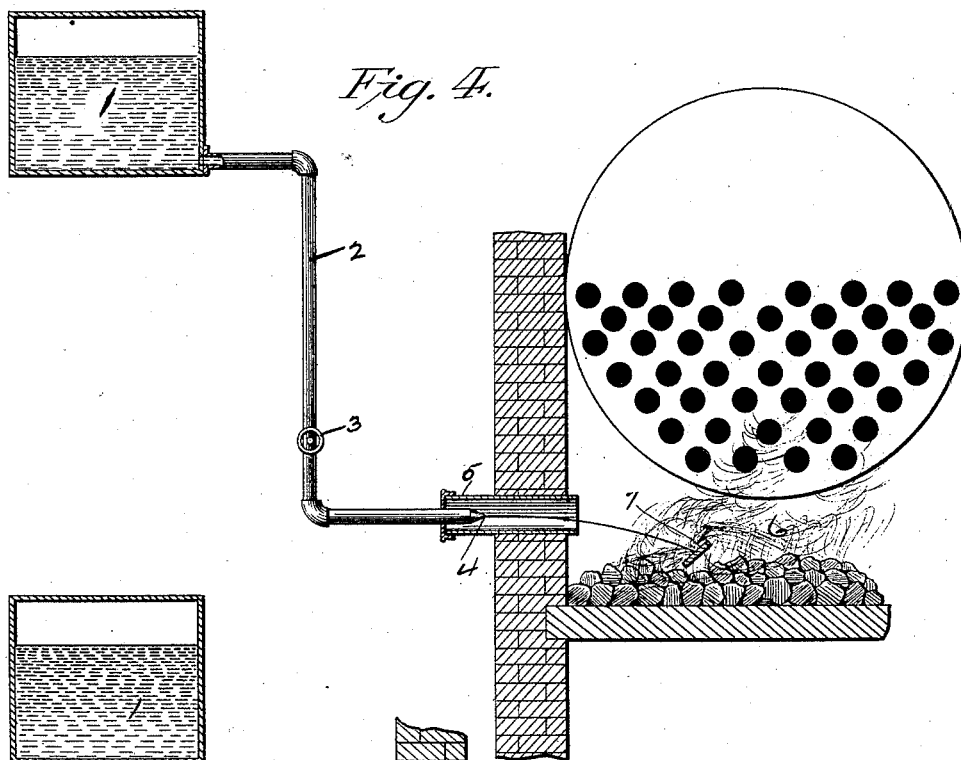
Jacob Breunerman Hough
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Witnesses:
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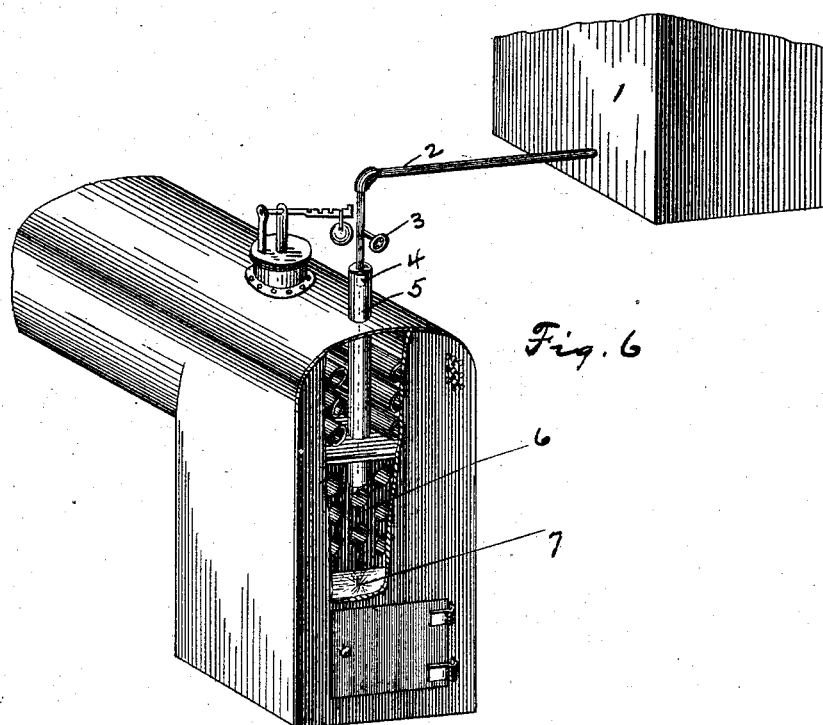
3 Sheets—Sheet 3.

J. B. HOUGH.

APPARATUS FOR BURNING LIQUID FUEL.

No. 422,884.

Patented Mar. 4, 1890.



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UNITED STATES PATENT OFFICE.

JACOB BRENNEMAN HOUGH, OF WAYNESVILLE, ASSIGNOR OF ONE-HALF TO
ISAAC M. BARRETT, OF SPRING VALLEY, OHIO.

APPARATUS FOR BURNING LIQUID FUEL.

SPECIFICATION forming part of Letters Patent No. 422,884, dated March 4, 1890.

Application filed October 16, 1889. Serial No. 327,236. (No model.)

To all whom it may concern:

Be it known that I, JACOB BRENNEMAN HOUGH, a citizen of the United States, and a resident of Waynesville, in the county of Warren and State of Ohio, have invented certain new and useful Improvements in Apparatus for Burning Crude Petroleum and other Liquids as Fuel; 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 which it appertains to make and use the same, reference being had to the accompanying drawings, and to the figures of reference marked thereon, which form part of this specification.

My invention relates to apparatus for burning crude petroleum and other liquids as fuel for generating heat in stoves, furnaces, and other heating devices. I seek by it to burn the liquid directly and to convey the liquid from its receptacle beyond the range of the heat generated and deposit it directly on the fire at the point of combustion in proper quantity safely and without hinderance or danger of obstruction.

One of the principal difficulties with the devices commonly used for conducting liquids used as fuel into places of combustion is that the effluent, emitting, or fire ends of the carrying or supplying pipes, tubes, or channels are exposed to flame or strong heat, which causes a coating or deposit to be formed in them obstructive of the liquid flow.

My invention protects these fire ends from such flame and heat, and thereby obviates or avoids the obstructive deposition of matter therein.

I accomplish the results aimed at by the mechanism and combination of agencies shown by the accompanying drawings and explanation thereof, in which like figures refer to like parts—that is to say,

Figure 1 is a vertical sectional view of my device applied to an ordinary cook-stove. Fig. 2 is an elevation, part in section, applied to a heating-stove. Fig. 3 is a vertical sectional view of a slightly-modified form applied to a cook-stove. Figs. 4, 5, and 6 show the application of my device to steam-boiler furnaces.

In Figs. 1, 2, 3, and 6, 5 represents a tube

or channel which I call the "freeway-passage." It is placed perpendicularly over the fire or point of combustion or "splasher" 7, entering into and through the top or upper part of the fire-box or fire-chamber to which it is usually attached, with its lower end open and the upper closed, substantially as indicated in the drawings. It may extend merely through such top, or, farther, to any desired point above or short of that of combustion, where the liquid is deposited, (7.) It extends far enough above or beyond such top or point of entrance as to insure its upper or outer end from becoming heated to a degree that will cause the coating or deposition of matter above referred to. Its usual diameter is from two-thirds of an inch to an inch for ordinary stoves, and the usual outside length is about two feet; but these may vary, the limits being that it should not be so small as to allow the liquid to touch it in passing through, nor so large or short as to admit of flame or strong heat for any considerable part of its length.

Into the upper or outer end of the freeway-passage is securely and tightly inserted and fastened the conveying or supply pipe 2, (of smaller diameter than 5,) which leads from the tank 1 (whose bottom is above the outer end of 5) to and terminates in the freeway-passage with a funnel end with small orifice at 4, substantially as represented. It (2) is supplied with a valve 3, by which the quantity or flow of the liquid is regulated or shut off.

In Figs. 4 and 5 the freeway-passage enters into the side or front of the fire box or chamber. In such cases the inner end should preferably be lower than the outer, and the more nearly perpendicular the freeway-passage the better; and there must be enough force applied to the column of liquid in the conveying-pipe 2, either by the elevation of the tank 1 or by the use of steam or other agent, to drive the fluid through the freeway-passage 5 without contact therewith onto the fire or splasher 7. The tubes or pipes 2 and 5 are of iron or other incombustible material, the other parts of usual material. The splasher 7 is of brick or iron, and is used to scatter the fluid. All parts are constructed, adjusted, and arranged substantially as represented in the drawings.

To operate the device, put the crude petroleum or liquid to be used as fuel into the tank 1, having first closed the valve 3. Place a lighted substance at the point of combustion
5 7. Turn the valve 3 so as to admit the liquid to pass through the funnel-point at 4 into and through the center of the freeway-passage 5 (filled with aeriform gaseous mixture, as it soon is, so constituted and confined as not to
10 support or admit of combustion) to the flame at 7. By the valve 3 regulate the quantity of the flow according to the amount of heat required, but within the limits of complete combustion. When the freeway-passage is not
15 perpendicular, force must be applied as and to the extent aforesaid.

Another object of my invention is to secure safety in the use of liquids as fuel. By means of it the oil in the supply pipes or channels is
20 protected from and never exposed to great heat or to flame. The fire ends of the supply-channels are protected from heat and flame.

What I claim as new and useful and as constituting my invention is—

In an apparatus for burning crude petroleum and other hydrocarbon oils as fuel, the
25 combination, with the stove or furnace having a spreading-plate, a vertically or horizontally extended tube closed at its outer end, open at its inner end, and communicating
30 with the fire-box of the stove or furnace, and a valved oil-supply pipe extending through the closed outer end and partly within the tube, and having an emitting-orifice within
35 and away from the walls of such tube, substantially as shown and described.

In testimony that I claim the foregoing as my own I hereby affix my signature in presence of two witnesses.

JACOB BRENNEMAN HOUGH.

Witnesses:

S. S. HAINES,
S. McCUNE.