

A. C. RAND.

Improvement in Burning Petroleum.

No. 128,656.

Patented July 2, 1872.

Fig. 1.

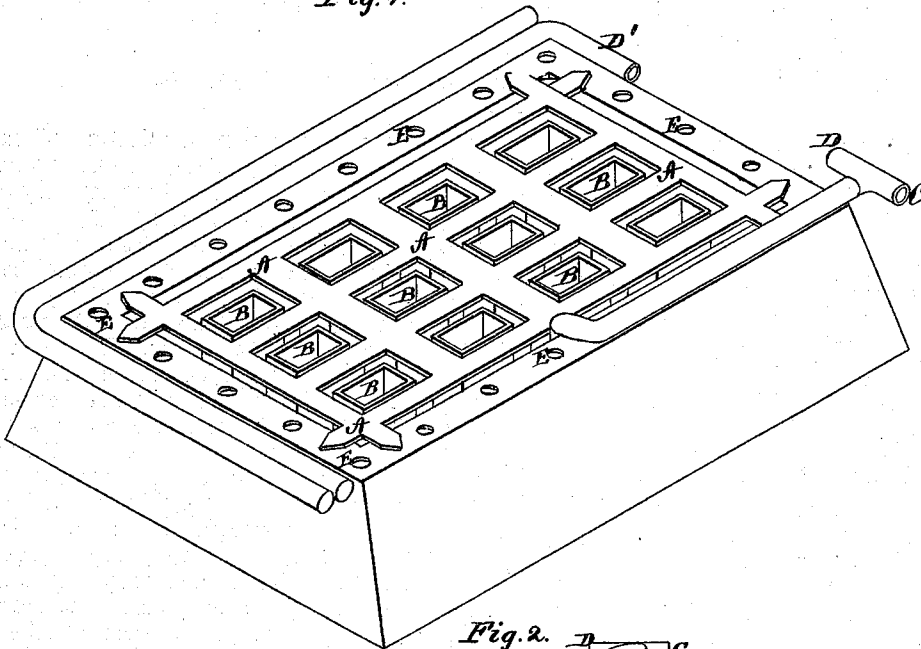


Fig. 2.

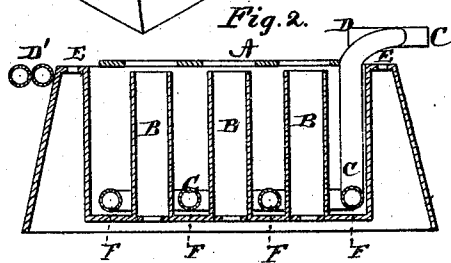
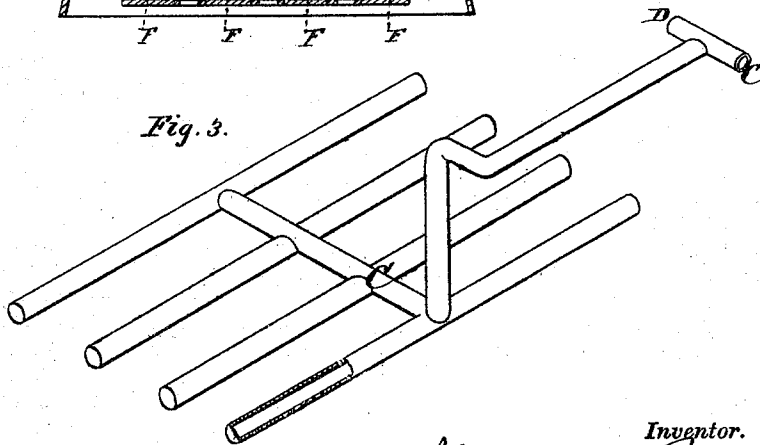


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE.

ALONZO C. RAND, OF AURORA, ILLINOIS, ASSIGNOR OF ONE-HALF OF
HIS RIGHT TO JOHN D. ADAMS, OF TITUSVILLE, PENNSYLVANIA.

IMPROVEMENT IN BURNING PETROLEUM.

Specification forming part of Letters Patent No. 128,656, dated July 2, 1872.

SPECIFICATION.

To all whom it may concern:

Be it known that I, ALONZO C. RAND, of the city of Aurora, county of Kane and State of Illinois, have invented a new and Improved Method of Utilizing Petroleum and other hydrocarbon liquids for fuel.

The invention relates to producing perfect combustion of petroleum, and consists of a pan provided with air-tubes and feed-pipes for steam and oil, all of which will hereinafter be fully set forth.

General Description.

In the drawing, A represents the deflector-bar; B, air-tubes; C, the inlet-pipe for oil; D, inlet end of pipe for steam; D', the steam-pipe; E, the air-inlets on the side of the pan; F, the holes in the bottom of the steam and oil feed-pipe. One pipe only is used for the steam and oil. They both are supplied to the pipe at the same time—the oil through branch-pipe C leading from the oil supply-tank, and the steam through branch-pipe D leading from and communicating with steam-boiler through pipe D and D', the oil and steam together passing through the holes F in the bottom of the distributing-pipe C in the bottom of the pan.

I will now proceed to describe the operation of this invention.

This invention, being particularly applicable to generating steam, we will describe its application to an ordinary steam stationary boiler. I first take out the grate-bars and place the oil-pan in their stead, carefully excluding the admission of air in all places except through the tubes B that extend through the bottom to the top of the pan and through the holes F in the flange. This I accomplish with brick and mortar, using care to set the pan as nearly on a level as possible. Then the cock regulating the supply of oil to the pan is opened and the oil permitted to flow into the bottom of the pan around the bottom sides of the air-tubes. It is then ignited. The whole pan in a few moments becomes quite hot, and the oil is almost instantly vaporized when it comes in contact with the pan. The equal distribution of the oil through the pan is accomplished by having the branches of the distributing-pipe made to conform to the sys-

tem of tubes in the pan, the bottom of said distributing-pipes having very fine and numerous perforations. The oil is thus equably fed throughout the entire bottom of the pan. The partially-ignited vapor arises, and its immediate escape is prevented by the deflector-bars A. These bars rest on the top of the pan in a horizontal position, and are directly over the spaces between the tubes B. The flame is thus deflected over the tubes B, where a bountiful quantity of the oxygen of the air becomes united with the flame, and the result is the perfect combustion of the oil. When the water in the boiler commences to vaporize, the steam-cock on pipe D' is slightly opened and the steam passes through the pipe D'. This pipe passes around and slightly above the oil-pan, so that the radiated heat may insure the steam being dry. It then passes into the oil feed-pipe through the pipe D, thence with the oil into the branch oil-pipes in the bottom of the oil-pan, and through the fine perforations in the bottom of the branch pipes. The object of thus furnishing steam to the oil feed-pipe through the perforations, as aforesaid, is to prevent the coke, which is a result of the vaporization of the petroleum, from adhering to the bottom of the pan, which would in a short time fill the pan with coke, and of course stop up the holes in the branch pipes. It is of great importance that the holes should be on the bottom of the pipes, that the steam may impinge with force upon the bottom of pan. The steam also serves to increase the temperature of the oil before it leaves the pipes, and by being forced by the steam against the bottom of the pan is broken into infinitesimal globules and carried upward with and by the current of steam—thus unlike all other devices for burning oil in pans. No coke is ever formed, as by the use of steam no body of oil is ever on the bottom of the pan; therefore no coke can be formed there. Coke of petroleum is the result of the distillation of petroleum in mass; the volatile having been driven off, the solid remains.

Having invented and used a pan provided with air-tubes in 1863, I do not claim that as a new invention; but

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

1. An upright pan, provided with vertical

air-tubes, in combination with an oil feed-pipe or pipes having perforations in the bottom or bottoms of the pipes, substantially as and for the purposes set forth.

2. The pipes C and D, substantially as constructed and shown, when used to convey oil and steam into the said oil-pan, as and for the purposes as described.

3. Perforating the bottom of the oil feed-pipe, and the use of steam in combination with said perforated pipe, for the purpose specified.

4. I claim as a new discovery the use of steam made to impinge upon a metal surface, in conjunction with any hydrocarbon liquid, for the purpose of preventing the formation of coke thereon.

ALONZO C. RAND.

Witnesses:

A. N. MARR,

JNO. SMITH.