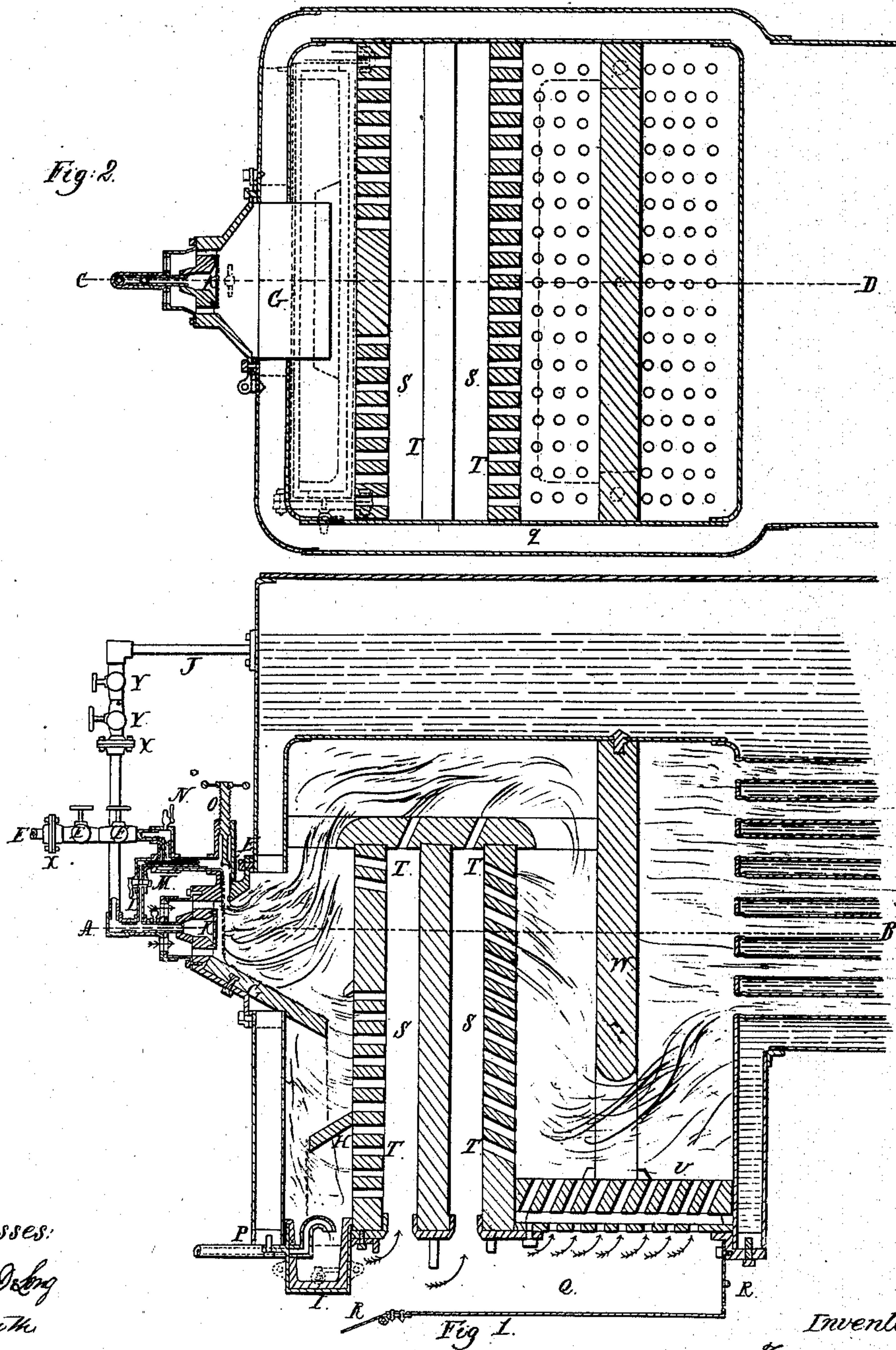


No. 68,706.

PATENTED SEPT. 10, 1867.

F. COOK.

APPARATUS FOR BURNING AS FUEL PETROLEUM AND OTHER
HYDROCARBON FLUIDS.



Witnesses:
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UNITED STATES PATENT OFFICE

FREDERIC COOK, OF NEW YORK, N. Y.

IMPROVED APPARATUS FOR BURNING PETROLEUM AS FUEL.

Specification forming part of Letters Patent No. 68,706, dated September 10, 1867.

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 useful Apparatus for Burning, as Fuel, Petroleum and other liquid hydrocarbons; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a longitudinal section through line C D, Fig. 2, and Fig. 2 is a horizontal section through the line A B of Fig. 1, of the apparatus used.

My invention relates to a new and improved method of burning liquid hydrocarbons, such as petroleum, as fuel; and consists in arranging the feed for the oil in the furnace-door, so that all the parts in the furnace may be readily got at by simply opening the door.

It also consists in an improved method of clearing the oil-passage from coke or other impurities; and it further consists (when the invention is applied to a steam-boiler) of an arrangement of a deflecting-plate, of tile or other suitable material, in front of the flues, for the purpose of forming a combustion-chamber and more thoroughly mixing and burning the gases before their escape into the tubes.

In the burning of liquid hydrocarbons as fuel it is desirable to have the apparatus by which the liquids are supplied so arranged that the parts may be readily got at for cleaning or repairs. I accomplish this result by bolting the feed apparatus to the furnace-door, making it in fact a part of the door, so that by disconnecting the feed-pipes the door may be opened and the parts inside the furnace repaired or cleaned, causing only a temporary stoppage of the fire, while if the apparatus is permanently fixed in the furnace it is more difficult and requires a longer time to get at.

The arrangement for clearing the feed-pipe of coke and other hardened impurities is very important when any part of the feed-pipe is exposed to the heat of the furnace. By means of a cutter, worked by a screw or other suitable means, in a few moments the pipe is cleared without interfering with the operations of the furnace.

The operation of the furnace is as follows:

The petroleum is admitted from a tank through the pipe E, which has double valves F F, one of which is used to let on and shut off the supply, the other to regulate the quantity. The petroleum drips onto the inclined plate G, made of tile, and from thence to the plate H, and from it to the trough I, where any portion remaining unburned may be consumed. J is a pipe communicating with the water-space of the boiler, to admit water inside the furnace, which, in passing through the perforated plate K, is finely divided and mixed with the falling petroleum, and by its partial decomposition aids in the combustion of the oil. The water-supply pipe J is supplied with double valves Y Y, for the same purpose as the oil-pipe. The use of water instead of steam supplies vapor to mix with the air immediately on starting the fire, which is an important desideratum in starting. A small water-pipe, L, is provided in case it may be desirable to mix a quantity of water with the oil in the oil-pipe E, the supply being controlled by the cock M. N is a cock to let off any gas that may accumulate in the pipe E. O is a coke-cutter, to clean out any accumulations in the orifice of the supply-pipe E.

The whole of the feed apparatus is hung or bolted onto the furnace-door, and by disconnecting the joints *xx* will swing out of the way and afford access inside the furnace.

P is an overflow-pipe in the trough I, to carry off any over-supply of petroleum. The trough I is lined with fire-brick, and has caps at each end, bolted on, in order to provide a means of clearing out dirt, sediment, or coke. Air is admitted into the air-box A by the dampers R. The air passes into the air-distributors S, and through the air-holes T, and also through the bottom tile hearth-plate, U, and the cast-iron plate V. W is a deflector-plate or fire-tile set in front of the flues, to prevent the too quick escape of the gases, and to form a combustion-chamber by which the air and gases may be thoroughly mixed, as well as to defend the tube-plate and tube ends from the intense heat. It also deflects the gases downward against the air-jets through U before their final escape through the flues.

This form of apparatus is very desirable for

locomotives, where it is necessary to have all the working parts in easy reach of the engineer.

Having thus fully described the nature of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a furnace for burning petroleum or other liquid hydrocarbons as fuel, the feeding apparatus connected with and arranged as a part of the furnace-door.

2. The employment of a cutter or cleaner, for the purpose of cleaning the oil-pipe, substantially as set forth.

3. The arrangement of the deflecting-tile W, when used for the purpose and in the manner substantially as described and shown.

4. The air-distributing tiles, when perforated and arranged substantially in the manner as described.

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