

C. Sauvage.

Hydrocarbon Burner.

Nº 86.871.

Patented Feb. 9, 1869.

Fig. 1.

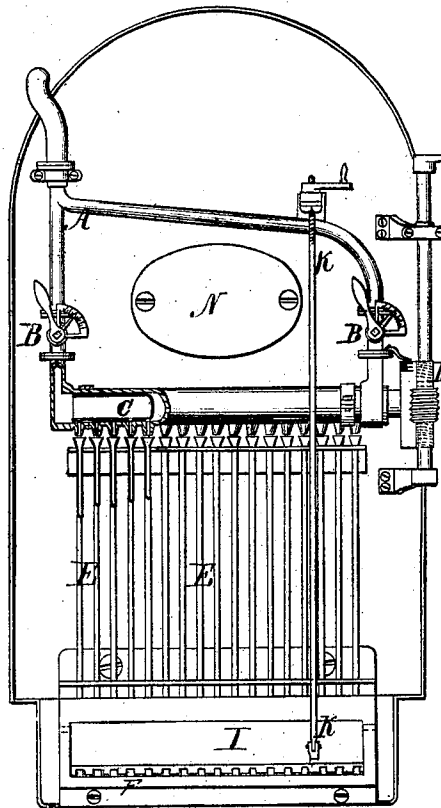


Fig. 2.

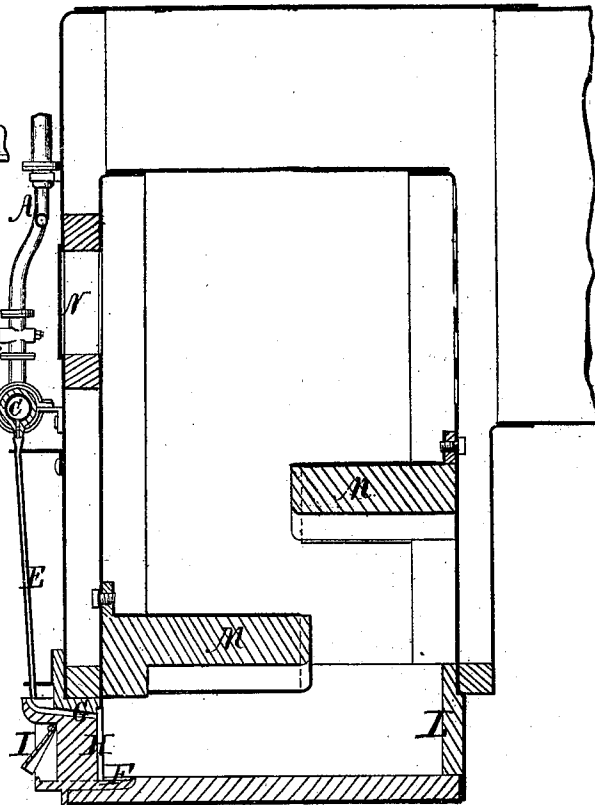


Fig. 3.

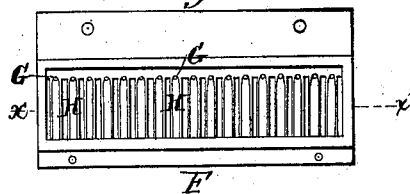
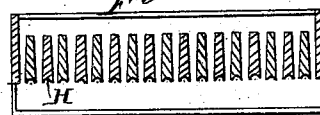


Fig. 4.



Witnesses;
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UNITED STATES PATENT OFFICE.

CLEMENT SAUVAGE, OF PARIS, FRANCE.

IMPROVEMENT IN HYDROCARBON-BURNERS.

Specification forming part of Letters Patent No. **86,871**, dated February 9, 1869.

To all whom it may concern:

Be it known that I, CLEMENT SAUVAGE, of Paris, in the Empire of France, chief mining-engineer, have invented certain new and useful Improvements in the Combustion of Liquid Fuel, and in the furnaces employed therein, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming part of this specification, and in which—

Figure 1 represents a front view of a locomotive-engine boiler with a certain combination and arrangement of devices for burning liquid fuel applied thereto; Fig. 2, a central longitudinal vertical section of the same; Fig. 3, a rear view or back elevation of the grate and Fig. 4 a horizontal section thereof through the line *xx* in Fig. 3.

Similar letters of reference indicate corresponding parts.

My invention relates to burning mineral oils in a direct manner, or free from necessary mixture with other materials, fluids, or vapors, in the furnaces of steam-boilers; and includes a peculiar construction or arrangement of grate, on which the combustion takes place, and down the incline surface of which the oil is run in small streams, surrounded as it were or divided by air. To attain this result the grate is provided with bars grooved on their fire sides or edges, into which grooves the oil is allowed to run from correspondingly-arranged supply-orifices, said bars being placed vertically or inclined, to secure a free flow of the oil; also, the invention includes a certain combination of devices governing or controlling the supply of oil, whereby an economical burning of the oil without the aid or mixture of water or steam is effected.

Although the improvements are here only shown as applied to an ordinary locomotive-boiler, the same, under suitable modifications, are applicable to furnaces of all kinds of steam-boilers under different forms of construction.

Referring to the accompanying drawing, A is a main oil supply or conducting pipe, which is fed from a reservoir situated on the engine or tender. This supply-pipe is formed or provided with branches fitted with regulating-faucets B B, to control the flow of the oil to the two ends of a horizontal distributing-tube, C, arranged within an outer shell or case, both of

which are perforated to admit of the discharge of the oil. The perforated distributing-tube C is fitted so as to be capable of turning, whereby it is made to operate as a faucet accordingly as the holes in it are brought more or less over or made to close the holes in the shell or case surrounding it. This is done by means of a screw, D, working into a worm-wheel on the end of said tube C, and whereby the flow of the oil into small vertical conducting-tubes E is regulated. These tubes distribute the oil to the grate F through orifices G, made therein at or near the top of each bar. The grate F has its bars H set to occupy a vertical, or nearly vertical, position, said bars being preferably of trapezoidal form, but with their inner faces grooved to hold and conduct the oil.

The air necessary to support combustion is made to enter through the spaces between the bars, its admission being regulated by a door or damper, I, operated by a rod, K.

The lining L of the fire-chamber and brick arches M of said chamber and fire-box are sustained by iron plates.

N is a door or man-hole, which is kept closed when the fire is going, but which serves to facilitate cleaning out and repair of the furnace when cold.

The fire may be kindled or lit by means of shavings, aided by the ordinary chimney-draft, the oil-supply faucets being but slightly opened when thus starting the fire. If, however, a stronger or quicker current is required to start the fire, a supplementary draft may be employed by means of a steam-jet obtained from another locomotive or by blast from a fan; also, afterward, or when the furnace is fairly going, instead of a natural current of air, a forced one may be used to keep up combustion, if desired or found necessary. Likewise, numerous changes as regards details of construction may be made. Thus any other suitable fire-proof material might be substituted for the brick-work of the furnace. Likewise, the number of the bars and surface-area of the grate be changed according to the power of the engine or size of the boiler. No ash-pan being necessary when using simply mineral oil as a fuel, the furnace may be constructed of a round instead of a square form.

My invention is here shown as applied to locomotives already built. To apply it to en-

gines or boilers built expressly with the view of using such fuel, which is ignited on the grate as it trickles down the grooves in the bars thereof, the arrangement and forms of the parts may be variously modified without departure from the general principle of action here represented and described.

The invention may be applied to furnaces of stationary and marine engine boilers.

The oils designed to be used are those having a petroleum character or origin.

What is here claimed is—

1. The grate F, with its grooved bars H, set to occupy a vertical or nearly vertical position, substantially as and for the purpose herein set forth.

2. The combination of a series of small dis-

tributing-tubes, E, the orifices G, made in or through the grate, and the upright grooved bars H, essentially as shown and described.

3. The combination of a main distributing-tube, C, constructed to act as a faucet, and having the oil fed to it from opposite ends, with the series of small distributing-tubes E and the grate F, made up of grooved bars H, essentially as specified.

In testimony whereof I have signed my name to this specification before two subscribing witnesses.

C. SAUVAGE.

Witnesses:

F. OLCOTT,

E. DIEUDONN.