(No Model.)

C. L. GOODRIDGE.

PROCESS OF RELIGHTING THE FLAME IN HYDROCARBON FURNACES.

No. 411,243. Patented Sept. 17, 1889.

Fig. 1.

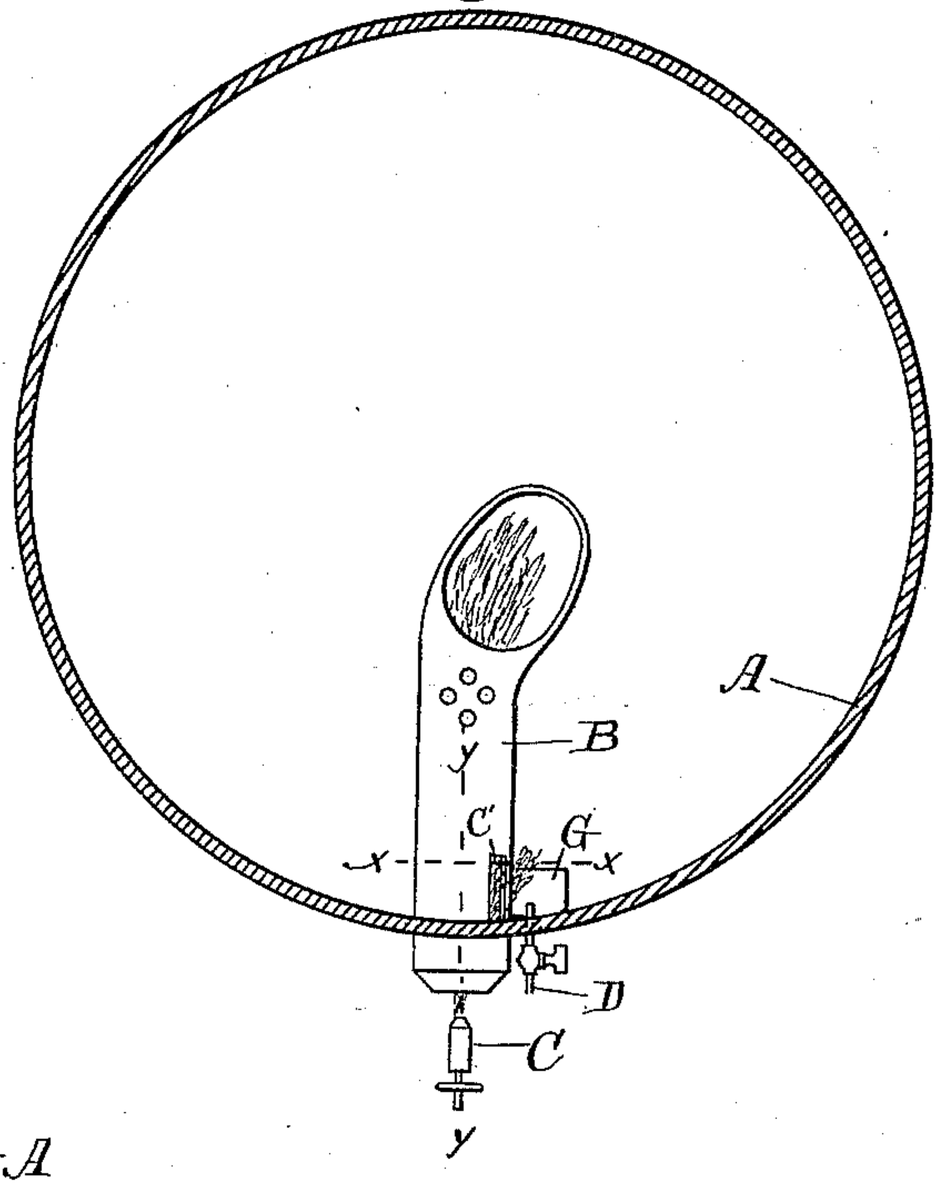


Fig. 2.

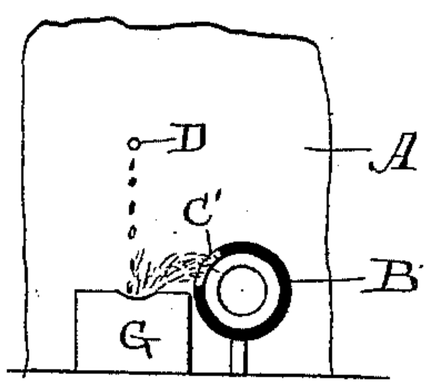
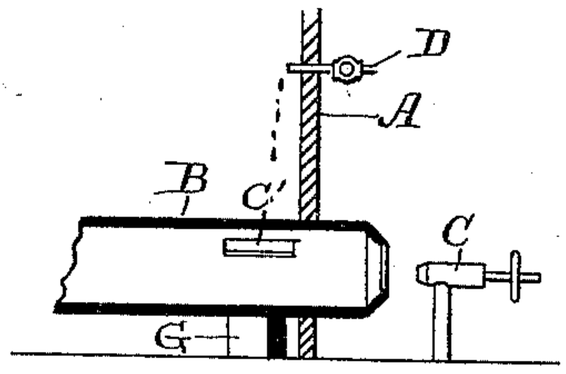


Fig. 3.



Witnesses:
Louis R. Dyer.
Chas. D. Schofield

Inventor:
Charles L. Goodridge
by S. N. Bates
his Atty.

UNITED STATES PATENT OFFICE.

CHARLES L. GOODRIDGE, OF PORTLAND, MAINE.

PROCESS OF RELIGHTING THE FLAME IN HYDROCARBON-FURNACES.

SPECIFICATION forming part of Letters Patent No. 411,243, dated September 17, 1889.

Application filed April 29, 1889. Serial No. 308,924. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. GOODRIDGE, a citizen of the United States, residing at Portland, in the county of Cumberland and State of Maine, have invented certain new and useful Improvements in Processes of Relighting the Flame in Hydrocarbon-Furnaces; and I do declare the following to be a full, clear, and exact description of the invention, such as 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 letters of reference marked thereon, which form a part of this specification.

My invention relates to hydrocarbon-furnaces wherein the heat is furnished by an ignited jet of steam or air and atomized oil blown into a retort or combustion-chamber placed within the furnace. In these furnaces, or in boilers which use kerosene or other hydrocarbon oil for fuel, much difficulty has been experienced in relighting the jet when it has become extinguished by any means, and the ordinary method has been to keep a torch burning constantly near the nozzle of the burner. When these furnaces were used on steam-launches and other boats, they were more than ordinarily liable to this objection, and the relighting lamp or torch, being outside the furnace proper, was liable to be extinguished by wind or water at the same time as the main flame. When the flame and the torch both went out, with a fresh wind blowing it was almost impossible to relight it, and as a consequence the furnace would be blown full of atomized oil, which, on being relighted, would explode with more or less force. It was the liability of furnaces of this sort to have their flame extinguished which has prevented their use in house-heating and for many other purposes to which they were otherwise adapted.

My invention is directed to providing a method of relighting the oil-jet when the same has been extinguished, which shall be absolutely sure, which shall be constant and automatic in its operation, and which shall not be acted upon by the wind or water or any disturbing force outside of the furnace.

The invention consists in causing a hydrocarbon or other inflammable liquid in small continuous quantities to come in contact with a heated refractory body placed in the furnace, whereby a small relighting-flame is always kept burning out of the reach of wind, &c.

My invention further consists of the specific manner of carrying out this process, as set forth in the claims.

In the accompanying drawings I have illustrated an apparatus by which my process may be carried into effect.

Figure 1 is a horizontal section through a vertical boiler. Fig. 2 is a section on the line *x x*, and Fig. 3 is a section on the line *y y*.

A is the boiler or furnace. B is the retort or combustion-chamber, and C is the hydrocarbon-burner, all of these parts being of any desired construction.

In this particular manner of carrying out my process I place a piece of refractory heat-retaining material, preferably fire-brick, G within the walls of the furnace and alongside of the combustion-chamber, in the side of which I cut a slot or opening C′. Above the fire-brick G, I introduce a small pipe D, connected with an oil-supply and provided with a suitable cock.

Having started the burner and heated the combustion-chamber and the adjacent parts, including the fire-brick, I allow the oil to flow from the end of the pipe D in small quantities, drop by drop, upon the fire-brick G, where it ignites and keeps a small flame burning at all times. If now the jet from the burner is extinguished by any means, the flame which is burning on the fire-brick is at once drawn in through the opening C′ and the fire is relighted.

The relighting-flame being within the body of the boiler is not liable to be extinguished, and if the flame should go out by any chance there will be enough heat retained in the fire-brick to start a new flame as the liquid continues to drop on it. Thus it is possible to submerge both the main burner and the fire-brick temporarily in water, and the fire will be at once relighted as soon as the water is removed.

Although I have here specified fire brick or clay, which is highly refractory and somewhat porous, as a desirable material on ac-

count of its heat-retaining qualities, any refractory material—such as asbestus or a mass of iron of considerable size—will answer the purpose. It is necessary to have a sufficient body to retain for a time heat enough to relight the inflammable liquid used, which may be kerosene-oil, naphtha, or any liquid capable of burning.

I have described particularly the process of dropping the liquid upon the refractory material from above, drop by drop; but it is obvious that I may otherwise conduct it into direct contact with the fire-brick with a similar result.

It is not essential that the fire-brick shall be heated before the device becomes operative. When the main flame is first started, the oil becomes lighted by it, and then as it continues to drop each drop lights the succeeding drop, so that a small blaze is sustained, which is always ready to relight the main flame, as described. When the brick becomes heated, its heat sets fire to the dropping oil. It will thus be seen that even if the fires are all shut off for a sufficient length of time to cool off the brick G and all other parts of the furnace the relighting-flame will still be present and ready to start the fire.

I claim—

1. The herein-described process of producing and sustaining an auxiliary flame for relighting a principal hydrocarbon or other flame, which consists in heating a mass of refractory material by placing it in contact with said principal flame and then conducting into contact with said refractory material a substantially-continuous supply of inflammable material independent of the main supply, substantially as shown.

2. The herein-described process of producing and sustaining an auxiliary flame for relighting a principal hydrocarbon or other flame, which consists in placing a mass of refractory material in contact with said principal flame and then continually dropping upon said refractory material a supply of inflammable material independent of the main supply, substantially as shown.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES L. GOODRIDGE.

Witnesses:
S. W. BATES,
ISAAC W. DYER.