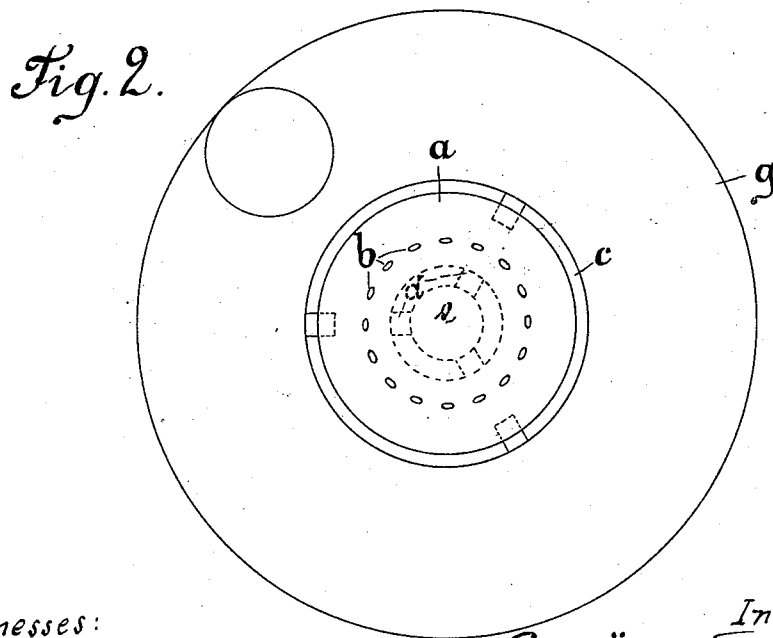
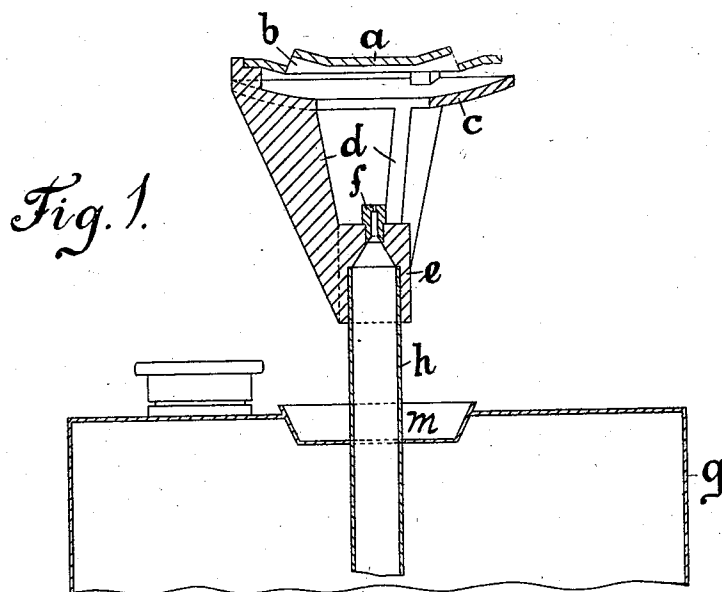


(No Model.)

C. ÖSTLUND & A. E. MALMSTRÖM.
WICKLESS PETROLEUM BURNER.

No. 558,415.

Patented Apr. 14, 1896.



Witnesses:

E. J. Griswold

L. Henke

Inventors

Carl Östlund and
A. E. Malmström

By their attorneys

Howson and Howson

UNITED STATES PATENT OFFICE.

CARL ÖSTLUND AND AXEL ELIS MALMSTRÖM, OF STOCKHOLM, SWEDEN.

WICKLESS PETROLEUM-BURNER.

SPECIFICATION forming part of Letters Patent No. 558,415, dated April 14, 1896.

Application filed March 20, 1895. Serial No. 542,509. (No model.) Patented in Sweden May 28, 1894, No. 5,516; in Belgium September 25, 1894, No. 112,007; in France October 19, 1894, No. 242,227; in Austria November 17, 1894, No. 44/5,897, and in Finland February 5, 1895, No. 548.

To all whom it may concern:

Be it known that we, CARL ÖSTLUND and AXEL ELIS MALMSTRÖM, subjects of the King of Sweden and Norway, and residents of Stockholm, Sweden, have invented certain Improvements in and Connected with Wickless Petroleum-Burners, (for which we have obtained patents in Sweden, No. 5,516, bearing date May 28, 1894; in Belgium, No. 112,007, bearing date September 25, 1894; in France, No. 242,227, bearing date October 19, 1894; in Austria, bearing date November 17, 1894, No. 44/5,897, and in Finland, bearing date February 5, 1895, No. 548,) of which the following is a specification.

This invention relates to improvements in wickless burners adapted for burning petroleum for heating purposes; and it has for its object to effect the complete combustion of the petroleum while at the same time preventing its becoming overheated and consequently decomposed, resulting in the deposition of carbon, as is often the case with ordinary wickless burners.

According to this invention, complete combustion is effected by providing the spreading-plate, which is located over the flame and around the edge of which the flame spreads, with apertures which are so arranged that they direct the part of the flame that passes out through them against the part of the flame that burns around the edge of the plate. In this way the products of combustion, the unburned gases, and the air carried along are effectually mixed together, with the result that complete combustion takes place. To prevent the overheating of the petroleum-vapor, the said vapor is not, as hitherto, led to the flame through pipes that are directly heated by the flame, so as to convert the petroleum into gas before it reaches the exit-aperture of the burner, but the petroleum is vaporized by conduction only, it being led to the said exit-aperture from the petroleum-reservoir through a pipe situate under the exit-aperture.

To this end the burner consists principally of an annular heat-conducting plate, which surrounds the flame and is connected by heat-conducting brackets with a piece of metal

provided with a hole and the necessary channel for the gas, and, it may be, with a valve for regulating the passage of the vapor through the channel. The said piece of metal is attached to the upper end of a pipe leading from the petroleum-reservoir. Above the said plate, and at a little distance therefrom, is located the spreading-plate, thus forming a passage for the flame between the two plates. By this arrangement the petroleum is heated sufficiently to pass into the gaseous state without being overheated.

In the accompanying drawings, Figure 1 is a vertical section of our improvement, and Fig. 2 is a plan view of the same.

a is the spreading-plate, around the edge of which the flame spreads itself, and *b* are apertures therein for the purpose hereinbefore mentioned.

c is the annular heat-conducting plate arranged under the spreading-plate *a*; *d*, the heat-conducting brackets which carry the plate *c*, and *e* is a metal piece, carrying a perforated nipple *f* and made, in the example shown, in one piece with the brackets *d* and the plate *c*. The piece *e* is bored out and secured over the pipe *h*, leading from the petroleum-reservoir *g*. The plate *c* is dished or on an incline, and the holes *b* are at a corresponding angle.

The stove is put into operation in the ordinary manner by first igniting spirit or the like placed in the cup *m* and, when this has nearly burned out, opening the valve, (where that is used,) whereupon the vapor produced rushes out through the exit-aperture in the nipple *f* and is ignited by the spirit flame. The piece *e* and the pipe *h* are then kept sufficiently warm, in the way already mentioned, to vaporize the escaping oil.

We claim as our invention—

1. In a wickless burner for burning petroleum, the combination of a nipple with brackets, an annular heat-conducting plate carried by said brackets and a flame-spreading plate over said annular plate, through the center of which plate the flame is adapted to pass, whereby the petroleum is heated sufficiently to pass into the gaseous state without being overheated, substantially as described.

2. In a wickless burner for burning petroleum, the combination of a nipple with brackets, an annular heat-conducting plate carried by said brackets and a flame-spreading plate over said annular plate, such flame-spreading plate being provided with apertures directing the flame which passes through them against the flame, which passes around the edge of the plate, all substantially as described.
- 10 3. In a wickless burner for burning petroleum, the combination of a nipple with an annular dished heat-conducting plate and a flame-spreading plate above said annular plate, the flame-spreading plate having per-

forations at an angle corresponding with the dish of the annular plate, the said perforations adapted to direct the flame which passes through them against the flame which passes around the edges of the annular plate, substantially as described.

In testimony whereof we have signed our names to this specification in the presence of two subscribing witnesses.

CARL ÖSTLUND.

AXEL ELIS MALMSTRÖM.

Witnesses:

FREDRIK L. ENQUIST,
OSKAR RINGSTRÖM.