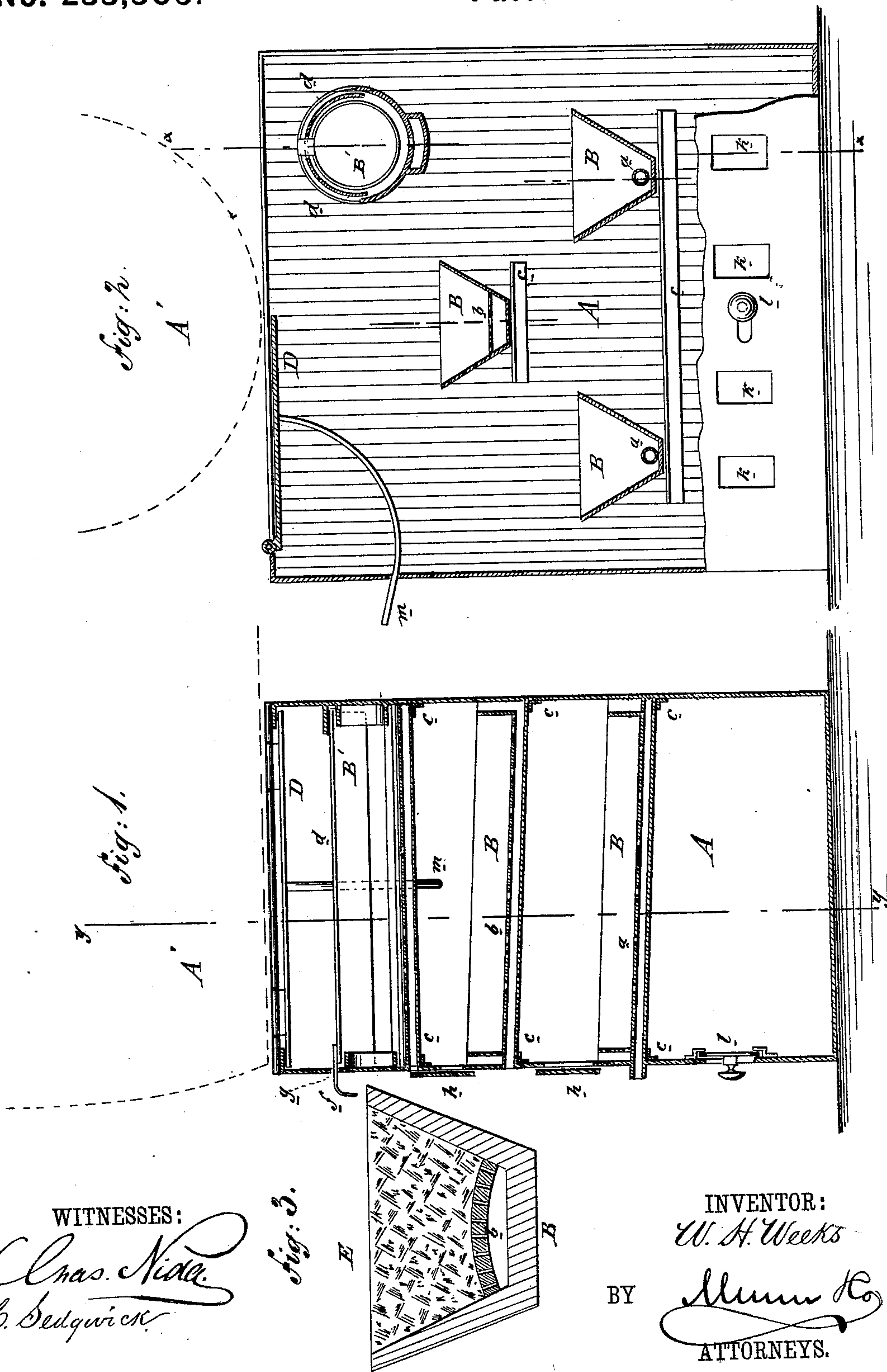


W. H. WEEKS.
Liquid Hydrocarbon Burner for Steam Boilers, &c.
No. 233,305. Patented Oct. 12, 1880.



WITNESSES:

Chas. Nida.
C. Sedgwick.

Fig. 3.

INVENTOR:

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BY

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WILLIAM H. WEEKS, OF DARTMOUTH, NOVA SCOTIA, CANADA.

LIQUID-HYDROCARBON BURNER FOR STEAM-BOILERS, &c.

SPECIFICATION forming part of Letters Patent No. 233,305, dated October 12, 1880.

Application filed February 4, 1880.

To all whom it may concern:

Be it known that I, WILLIAM H. WEEKS, of Dartmouth, in the county of Halifax, Province of Nova Scotia, Dominion of Canada, have invented a new and Improved Liquid-Hydrocarbon Burner for Steam-Boilers, &c., of which the following is a specification.

Figure 1 is a vertical sectional side elevation of the device on line *x x*, Fig. 2. Fig. 2 is a front elevation, partly in section, on line *y y*, Fig. 1. Fig. 3 is a cross-section of a pan or bar containing fragments of some refractory substance to form a combustion-surface.

Similar letters of reference indicate corresponding parts.

The object of this invention is to provide a device for the safe and economical burning of liquid hydrocarbons under boilers, evaporators, &c., whereby the combustion shall be perfect and the control over the flame absolute.

The invention consists of open pans placed at different levels in a fire-box or combustion-chamber, each pan having a perforated false bottom or pipe for the introduction of the liquid hydrocarbon, and each pan being wholly or partially filled with some crushed or granulated refractory substance, through which the said liquid hydrocarbon may percolate or be drawn by capillary attraction; and it further consists of covers or dampers provided for the pans or the fire-box, whereby the flame may be cut off from the boiler or be entirely extinguished.

In the drawings, A represents a fire-box or combustion-chamber set under a boiler or evaporator, A'. B B are the pans, or "grate-bars," as they may be called, preferably made with narrow bottoms, as shown, and outwardly-sloping sides, for the better distribution and exposure of the hydrocarbons. Perforated tubes *a a* or perforated false bottoms *b b* are fixed within these pans or bars B B, so that the liquid hydrocarbons introduced into said pans or bars from the outside shall readily flow throughout them. These pans B B have their ends resting on suitable bearers *c c*, and are generally set at a slight incline, as shown, to insure a freer flow of the liquid fuel, and are designed to be filled with fragments of some refractory material, as shown at E, Fig. 3.

At B' is shown a pan of semicircular cross-section, provided with the usual perforated false bottom or tube for the introduction of the liquid hydrocarbon, and having also an adjustable cover, *d*, that, by means of the handles *f*, that project through the semicircular slot *g* in the front of the fire-box A, can be drawn up to close the said pan B' when it is designed to extinguish the fire therein.

In the front of the fire-box A, and over the ends of the pans B B', are the doors *h*, by means of which the admission of air above the said pans B B', to facilitate the combustion of the liquid fuel, is regulated and the refractory filling allowed to be mixed and stirred, while below these doors *h* are the air-openings *k*, regulated by a damper, *l*, for supplying air beneath the said pans or bars B B'.

In the top of the combustion-chamber or fire-box A is a damper, D, controlled by the rod *m*, by means of which the flame from the burning liquid fuel may instantly be turned from the boiler A', if desired. These pans or grate-bars B B' are designed to be so far removed from the boiler or evaporator as to give sufficient room for complete combustion of the gases before they shall come in contact with the surface to be heated.

The pans or bars for containing the liquid hydrocarbons may be made of refractory clay, iron, or any other material that will withstand a high temperature; and these pans or bars B B' are designed to be so arranged in the fire-box or combustion-chamber A that when the hydrocarbon is ignited in the lower row the ascending heat will vaporize and ignite the hydrocarbon in the upper pans or bars, and so on until the combustion-chamber is filled with a body of intensely-heated flame.

To decrease the amount or intensity of heat at any time the supply of hydrocarbon is first shut off from the lower pans or bars, and then from those above, and all the pans or bars may be provided with covers, as shown, applied to pan or bar B', wherewith to subdue the fire at once.

The bottom of the fire-box or combustion-chamber A, beneath the pans or bars B B', may be strewn with a quantity of refractory substance, like that put in the said pans or bars, such as cinders, ashes, oxides of metals, soap-

stone, fire-brick, &c., that may be used as an additional fire-surface on the introduction of liquid hydrocarbon thereon, and for safety in the event of the liquid hydrocarbon overflowing from the pans.

I am aware that it is not broadly new to burn hydrocarbon in perforated vessels by means of refractory substances; but

What I claim is—

A hydrocarbon-burner for steam-boilers, consisting of a combustion-chamber having the damper D and bottom perforated pans on bearers c, as shown and described.

WILLIAM HENRY WEEKS.

Witnesses:

WM. R. FOSTER,
OWEN J. FULLER.