

(No Model.)

C. H. BACHY.
FURNACE FOR BURNING HYDROCARBONS.

No. 580,360.

Patented Apr. 13, 1897.

Fig. 1.

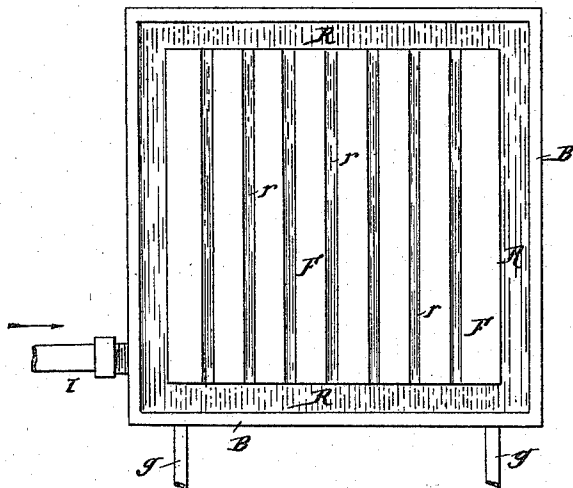


Fig. 2.

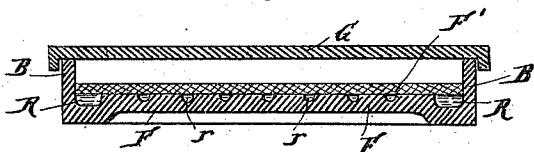


Fig. 3.

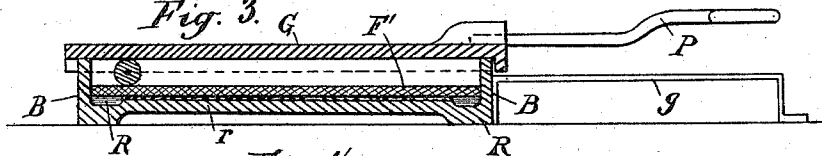


Fig. 4.

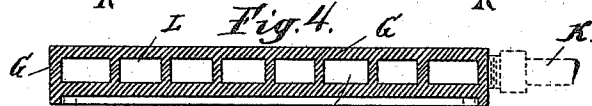
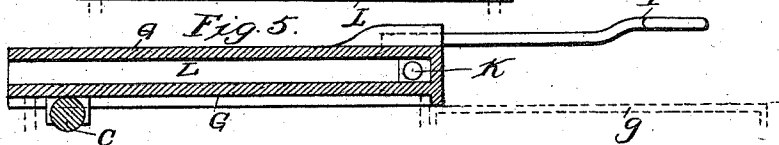


Fig. 5.



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UNITED STATES PATENT OFFICE.

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FURNACE FOR BURNING HYDROCARBONS.

SPECIFICATION forming part of Letters Patent No. 580,360, dated April 13, 1897.

Application filed October 19, 1895. Serial No. 566,210. (No model.) Patented in France August 17, 1894, No. 240,805; in Belgium December 6, 1894, No. 107,761; in Hungary February 2, 1895, No. 2,111; in Italy February 18, 1895, No. 48, and in Austria February 5, 1896, No. 2,919.

To all whom it may concern:

Be it known that I, CHARLES HECTOR BACHY, a subject of the King of Belgium, and a resident of Girault, in the Kingdom of Belgium, have invented certain new and useful Improvements in Hydrocarbon-Furnaces, (for which patents have been obtained in France, No. 240,805, dated August 17, 1894; in Belgium, No. 107,761, dated December 6, 1894; in Hungary, No. 2,111, dated February 2, 1895; in Italy, Certificate No. 48, dated February 18, 1895, and in Austria, No. 2,919, dated February 5, 1896,) of which the following is a specification.

My invention relates to an improved construction of furnace for the rational utilization of liquid hydrocarbons in the heating of steam-generators, of metallurgical furnaces, and generally for all industrial heating-furnaces, which is characterized by the direct and radical combustion of such products, without the necessity of their being preliminarily dispersed, vaporized, or gasified by any special supplemental plant, thus obviating the inconveniences and risks inherent to the systems named, while at the same time it is thus reduced to the simplest form of construction, it offers considerable advantages in economy, calorific power, and particularly as regards its capability of being substituted for solid-fuel furnaces at present in use without any difficulty whatever and without necessitating important modifications. These manifold results are obtained by the special means of presenting the liquid hydrocarbons for combustion in the form of a sheet of large superficial area, not directly, but after absorption, of the liquid hydrocarbon by a layer of permeable material in which it ascends by capillary action and on the surface whereof it is consumed under the action of natural or forced draft, as may be required.

My invention consists in a hydrocarbon-furnace having features of peculiar construction hereinafter described and claimed. A hydrocarbon-furnace having such features of construction is shown in the accompanying drawings, in which—

Figure 1 is a plan view of my improved hydrocarbon-furnace, the permeable layer and

sliding cover being omitted. Fig. 2 is a cross-section of the complete furnace. Fig. 3 is a longitudinal section thereof. Fig. 4 is a cross-section showing a modified form of sliding cover. Fig. 5 is a longitudinal section thereof.

My furnace comprises a horizontal reservoir or flat basin B of quadrangular form, provided with peripheral channels R, presenting an elevated bottom F.

r are grooves extending longitudinally in the surface of the bottom, so as to connect the rear and front channels of the reservoir or basin. The grooved bottom F is covered with a sheet F' of felt amianthus (flexible asbestos) or other analogous permeable material through which the liquid hydrocarbon, supplied by means of the peripheral channels R, is uniformly spread or distributed through means of the longitudinal grooves r , from which it ascends by capillary action. The fixed level of the liquid hydrocarbon in the grooves is maintained at and never rises above that of the surface of the bottom F except by capillary action. The sheet F' may extend over the peripheral channels, as shown.

It will be readily understood that on applying a light to the surface of the permeable sheet F' a formidable sheet of flame of considerable area can be maintained, which, however, will need to be regulated at the pleasure of the user by contracting its extent and also by enlarging it, if necessary, with a view to any needful decrease or increase in the heat developed in the furnace in accordance with the requirement.

Means for regulating the extent of the sheet of flame is provided in the form of an air or blast plate G, which is adapted to cover the entire extent of the basin and rests on the tops of the side walls. The plate is adapted to slide and is guided in its sliding movement by any ordinary and well-known means. At the rear end the cover-plate G is provided with handles P, by the aid of which the cover-plate can be opened and closed at pleasure, thus regulating the extent of the sheet of flame. The cover-plate alone would not be sufficient to secure the attainment of this end, inasmuch as the fire might find an outlet toward the rear under the plate and its extent

sion, which must be avoided. For this purpose the front end of this cover-plate G carries on its under surface a roller or cylinder C, made of some incombustible refractory material. This roller extends across the entire width of the basin B and rotates on journals carried in depending lugs on the cover-plate and runs in close contact with and over the permeable sheet F' of the basin, thus constituting an inclosed space between the cylinder and the rear wall of the basin B, (see Fig. 3,) where no fire can exist and the flame is necessarily extinguished, for the reason that air is lacking to support combustion, so that in exact proportion as the roller is advanced or drawn back, that is, as the cover-plate is closed or opened, the sheet of flame is decreased or increased at pleasure. This construction has also the advantage of enabling the fire itself to be instantaneously extinguished even if the entire surface of the permeable sheet were to catch fire, inasmuch as for this purpose it would simply suffice to push the roller quickly forward by closing the cover-plate rapidly, and thus cover up and close the entire area of combustion or surface of the basin. The igniting of the permeable sheet is also quite instantaneous. The basin in fact while covered up and closed becomes charged or filled underneath the cover-plate with a certain accumulation of hydrocarbon gas or vapor, such gas or vapor being there confined and retained by reason of the perfect jointing and close fitting of the several parts, so that in order to rekindle the fire it suffices to slightly withdraw the cover-plate and to apply a flame over the openings to insure the immediate ignition of the accumulated gas, an advantage of great importance.

The cover-plate G is guided and supported at the rear of the basin by horizontal bars *g* or in any other suitable or convenient manner, so as to prevent the cover-plate falling when more than half open.

The furnace constituted as above described, of the dimensions conformable to the purpose for which it is required, may be readily introduced or inserted into the furnace-chamber of any existing system of heating, however applied. For example, it can be placed in the fire-box of a locomotive, wherein it simply takes the place of the fire-grate, where it develops a vast layer or bed of fire and flame of high calorific power, as the liquid hydrocarbon, such as petroleum, is vaporized with the utmost facility under the influence of the permeable bottom and is rapidly consumed un-

der the action of the air entering by the front end of the furnace. For the purpose of augmenting the calorific power and effect, as, for instance, in special cases of furnaces for industrial purposes requiring excessive heat, it will suffice simply to send into the furnace a draft or current of hot forced air applied close above the flames, and this can be most rationally accomplished by constructing the interior of the cover-plate G with tuyers L, extending longitudinally from end to end, open in front and connected up at the rear end of the cover-plate by a transverse channel common to all the tuyers, and fed by means of a tube K, communicating with a suitable air-compressor or blowing apparatus, (not shown,) as may be convenient and suitable. For this purpose the cover-plate is made of greater depth with a top and bottom and divided by longitudinal partitions into the requisite number of air-conduits or tuyers. (See Figs. 4 and 5.) The supply-feed of petroleum or other liquid hydrocarbon to the peripheral channels R of the basin may be accomplished in any convenient and suitable manner.

Having thus described my invention, the following is what I claim as new therein and desire to secure by Letters Patent:

1. A hydrocarbon-burner comprising a basin having a bottom elevated in the middle so as to form with the side walls a gutter or groove continuous around the elevated part of the bottom and in the surface of which bottom grooves are provided communicating with the gutter, and covered with a sheet of porous material extending into the peripheral gutter; substantially as described.
2. A hydrocarbon-burner comprising a basin having a sheet of porous material placed on the bottom thereof and a cover-plate longitudinally adjustable on the said basin and carrying on its lower surface a cylinder or roller adapted to roll upon the whole width of the permeable sheet, and to increase or decrease the surface of the sheet in front of the roller; substantially as described.
3. A hydrocarbon-burner comprising a basin having a layer of permeable material placed on the bottom thereof, an adjustable hollow cover-plate divided by intermediate partitions into channels or multiple flues and means for supplying air to the flues; substantially as described.

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Witnesses:

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