May 15, 1923. 1,455,186

E. BECKER

FURNACE FOR LIQUID FUEL

Filed Dec. 20, 1921

Fig. 1.

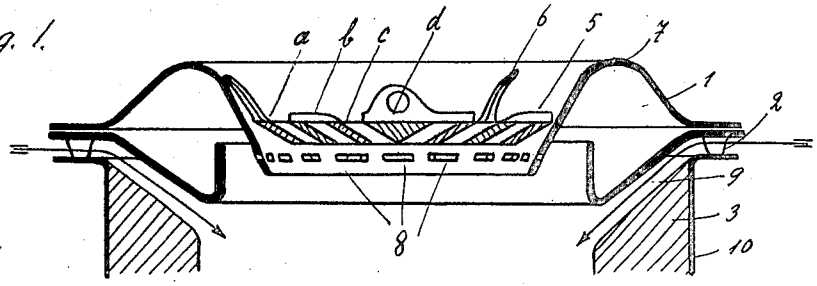
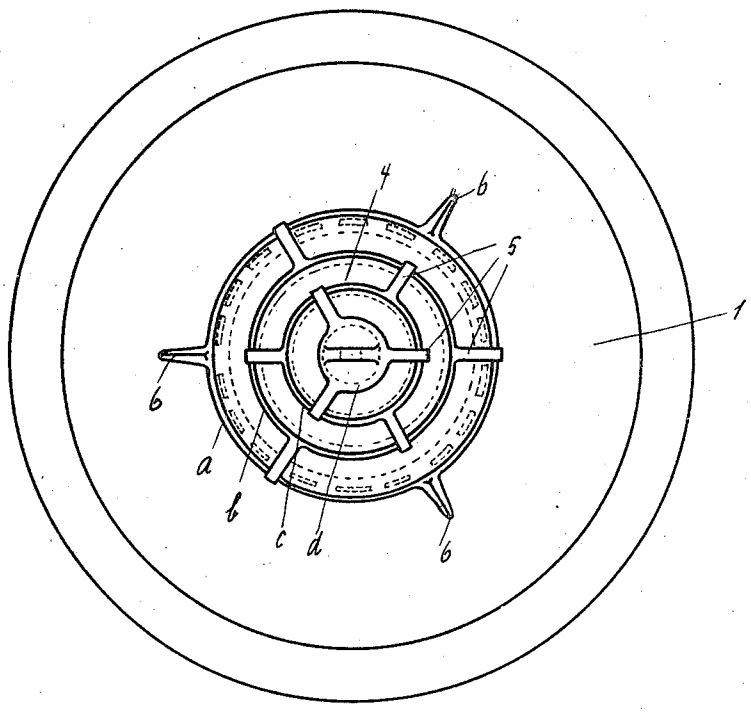


Fig 2



Witnesses:
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UNITED STATES PATENT OFFICE.

ERICH BECKER, OF BAD SOODEN, GERMANY.

FURNACE FOR LIQUID FUEL.

Application filed December 20, 1921. Serial No. 523,793.

To all whom it may concern:

Be it known that I, ERICH BECKER, a citizen of the German Republic, residing at Bad Sooden, Germany, have invented certain new and useful Improvements in Furnaces for Liquid Fuel, of which the following is a specification.

For the working of furnaces as described in my patent application of 10th March, 1921, Serial Number 451360, the special guiding of the air for combustion which is previously heated in the envelope of the apparatus has proved to be of special advantage. The production of heat in the oil heating apparatus described in the above cited application is very favorably influenced by the fact that the gasifying gutter is surrounded at all sides by air for combustion. With this object in view the air current which flows out of a jacket of the oil furnace is preferably subdivided in such a manner that part of the air is conducted over the dome-shaped cover of the gasifying gutter and into a combustion chamber through the circular opening left free by said circular gutter whilst the remaining previously heated air for combustion flows into the combustion chamber through a slot arranged between the refractory masonry of the burner and the circular gasifying gutter along the lower outer wall of said gutter. Both air currents have preferably the shape of a downwardly directed cone wherefrom results that the flame formed by the oil gas flowing out of the carburettor and by the upper air current which flows over the cover, adopts a conical shape and that this flame issues later on in contact with the conical upper air current upon its entire surface so that it is entirely enveloped by said air. A further result of this arrangement is the thorough combustion of the oil gas and the production of an extraordinarily great heat in the oil burner.

The conical shape of the upper air current is preferably produced by a ring-shaped grate which is mounted in the circular gap left free by the gasifying gutter and upon a convenient support projecting from said gutter.

In order that the invention may be clearly understood, I shall proceed to describe the same with reference to the form of construction shown by way of example on the accompanying drawing, wherein:—

Fig. 1 is a longitudinal section, and

Fig. 2 a plan view.

The drawing shows that the several rings of the grate are of downwardly and inwardly inclined cross section which form is of importance for the production of the conical shape of the flame. The conical shape of the lower air current is produced by the profile of the lower part of the gasifying gutter and of the fire brick wall upon which the gutter is mounted eventually with the aid of spacing devices. The direction of the slot which is left free between the two profiles is such that the lower air current comes in contact with the oil-gas flame in the shape of the mantle of a cone or of a part of the same.

The arrangement of narrow, circular or slit-shaped openings in the cover of the gasifying gutter near the bottom edge has further proved to be specially advantageous. Such openings which are also shown in the drawing, have the effect that the air for combustion which flows in downward direction over said openings is subdivided again as part of this air is deflected towards the interior of the carburettor so that this part of the air for combustion serves for producing the rapid movement in the combustion chamber of the oil gas which has been produced in the gasifying gutter.

Referring to the drawing: 1 is the gasifying gutter mounted with the aid of spacing members 2 upon the refractory wall 3 of the cylindrical oil burner. The circular air grate 4 is composed of concentric rings *a*, *b*, *c* and of a conical center piece *d*. The circular grate can be cast in one piece or composed of separate removable rings. The latter arrangement presents the advantage that if one of the rings should be damaged, it can be easily replaced. The circular grate is further mounted so high that it is sufficiently distant from the combustion chamber and possesses consequently considerable capability of resistance.

If the circular grate is composed of several removable parts, the rings are preferably mounted the one upon the other by means of radial extensions 5, the outer ring being mounted upon this curved wall of the cover 7 of the carburettor by extensions 6 which are longer than the radial extensions 5.

When the furnace works the upper air current flows over the curved cover 7 of the carburettor 1 through the circular grate 4 into the combustion chamber in traversing

partly the openings 8 which are arranged in the bottom end of the cover. These openings can consist of round holes or of right angular slits. The lower current of the air for combustion flows through the annular slot 9 which is similarly directed as the lower wall of the gasifying gutter and whose width can be regulated by means of the spacing devices 2. The air which flows continuously through the slot 9 and which has been previously heated in the mantle space 10, prevents the excessive heating of the gasifying gutter by the heat radiating from the combustion chamber and from the incandescent fire brick wall so that the coking of the liquid fuel and the burning through of the gasifying gutter are prevented. The same air current ensures also a complete combustion of the oil gas produced in the gasifying gutter and it is previously heated at the upper edge of the outer wall 3 when flowing through slit 9.

I claim:—

1. An improved furnace for liquid fuel in which the gasifying gutter is surrounded at all sides by air for combustion comprising in combination with the annular gasifying gutter, supports for the inner circumference of said gutter, a dome-shaped cover of said gasifying gutter, a ring-shaped grate upon said supports serving as passage for part of the air for combustion, feet of said gasifying gutter and a wall of refractory material upon the upper edge of which said gasifying gutter is mounted by means of its feet so that a gap is formed between the lower surface of said gutter and the upper edge of said wall said gap serving as passage for the remainder of the air for combustion this air being thus subdivided into two separate currents.

2. An improved furnace for liquid fuel in which the gasifying gutter is surrounded at all sides by air for combustion comprising in combination with the annular gasifying gutter having a downwardly inclined lower surface, supports projecting from the inner circumference of said gutter, a dome-shaped cover of said gasifying gutter, a ring-shaped grate upon said supports serving as passage for part of the air for combustion, feet of said gasifying gutter and a wall of refractory material having a downwardly inclined upper edge upon which said gasifying gutter is mounted by means of its feet so that a gap is formed between the lower surface of said gutter and the upper edge of said wall said gap serving as passage for the remainder of the air for combustion this air being thus subdivided into two separate currents both currents adopting the shape of a downwardly directed cone owing to the shape of the two passages.

3. An improved furnace for liquid fuel in which the gasifying gutter is surrounded at all sides by air for combustion comprising in combination with the annular gasifying gutter, supports for the inner circumference of said gutter, a dome-shaped cover of said gasifying gutter having narrow slots at some distance above its lower edge, a ring-shaped grate upon said supports serving as passage for part of the air for combustion, feet of said gasifying gutter and a wall of refractory material upon the upper edge of which said gasifying gutter is mounted by means of its feet so that a gap is formed between the lower surface of said gutter and the upper edge of said wall, said gap serving as passage for the remainder of the air for combustion this air being thus subdivided into two separate currents part of the upper current of the air for combustion flowing through the narrow slots of the cover of the gasifying gutter into the combustion chamber to activate the flow of the oil gas in said combustion chamber.

In testimony whereof I affix my signature.

ERICH BECKER.