W. M. BURDON.

LIQUID FUEL FURNACE.

APPLICATION FILED NOV. 3, 1917.

1,275,841.

Patented Aug. 13, 1918.

2 SHEETS—SHEET 1.

Fig. 1.

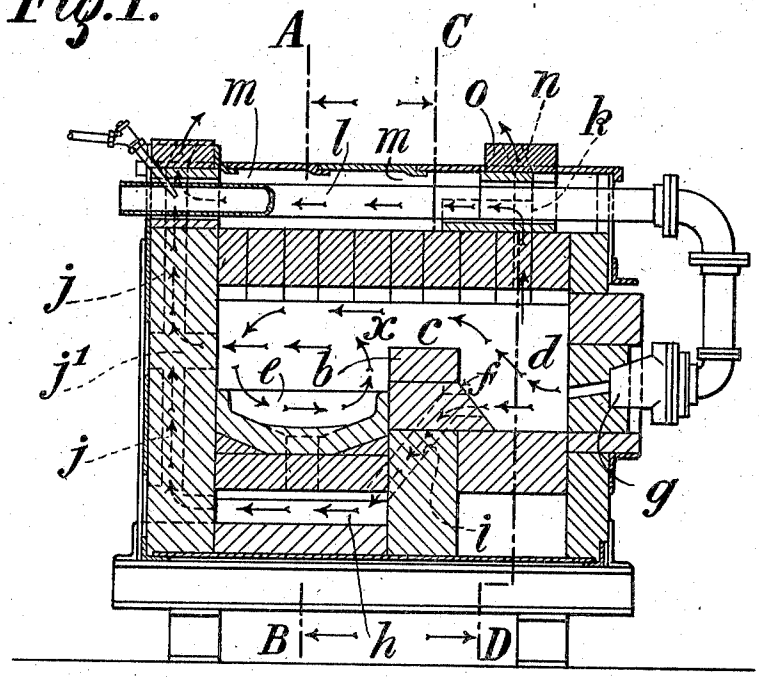
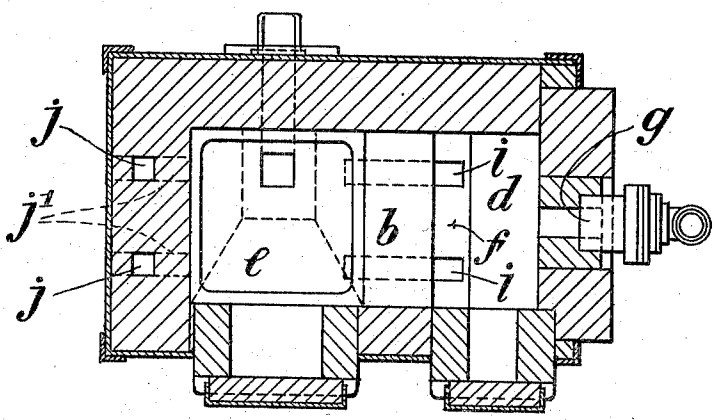


Fig. 2.



Inventor.
William Murray Burdon.
by Dearborn & Whittemore.
Attorneys.

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

W. M. BURDON.

LIQUID FUEL FURNACE.

APPLICATION FILED NOV. 3, 1917.

1,275,841.

Patented Aug. 13, 1918.

2 SHEETS—SHEET 2.

Fig. 3.

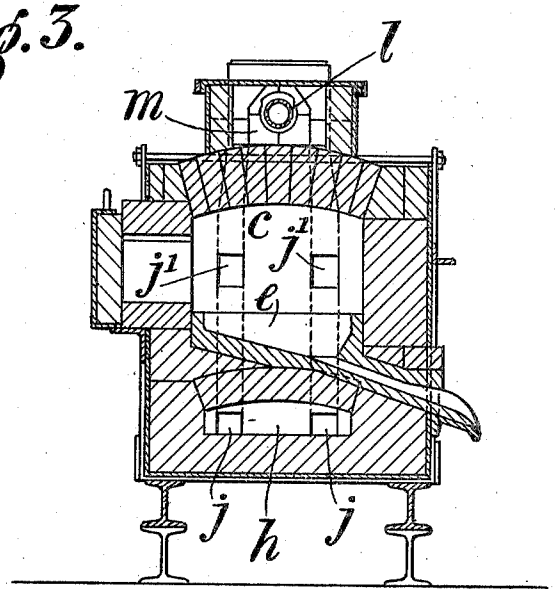
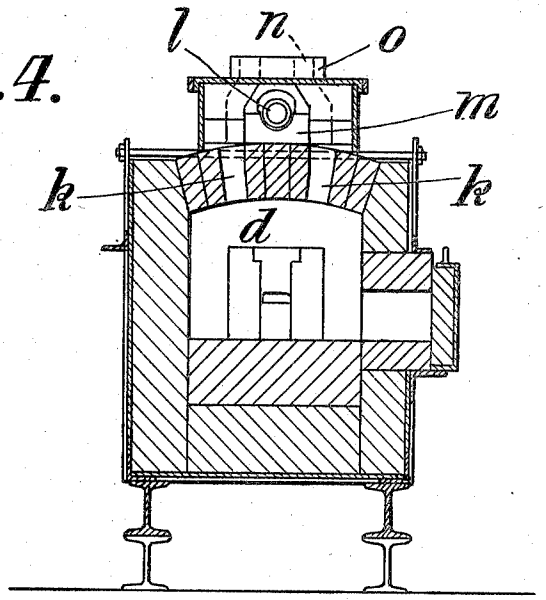


Fig. 4.



Inventor:
William Murray Burdon.
By Biederstein & Fairbanks.
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM M. BURDON, OF BELLSHILL, SCOTLAND, ASSIGNOR TO BURDONS LIMITED, OF BELLSHILL, SCOTLAND.

LIQUID-FUEL FURNACE.

1,275,841. Specification of Letters Patent. Patented Aug. 13, 1918.

Application filed November 3, 1917. Serial No. 200,027.

To all whom it may concern:

Be it known that I, WILLIAM MURRAY BURDON, a subject of the King of Great Britain, residing at Bellshill, Lanarkshire, Scotland, have invented certain new and useful Improvements in Liquid-Fuel Furnaces, of which the following is a specification.

This invention relates to liquid fuel furnaces of the type known as "oil gas" furnaces, and comprising a carbureter or retort for generating the oil gas from a mixture of oil vapor or spray and air, the object being to so make such furnaces that brass or other metals and alloys can be rapidly and effectively melted therein.

Heretofore, in furnaces of this kind, especially when melting yellow brass, the spelter was readily volatilized and, after the furnace had been run for some time, subliming took place on the inner surface of the flues thereby choking them up, while, at the same time, the carbureter was thickly coated.

Under my invention I so construct the furnace that the oil gas flame, or flames, or jet or jets, is, or are, directed into a primary combustion chamber, this chamber having a cross wall or partition which extends up a distance from the floor and over which the flame or flames can pass to the melting bath. The aforesaid cross wall has, preferably, a sloping or curved front against which the flame, or flames, or jet, or jets, can strike and then curl or bend upward. According to the temperature desired in the bath of the furnace the cross wall aforesaid may be raised or lowered (or added to or reduced) and this is, preferably, done by having a door at one or both sides of the furnace through which bricks or blocks can be inserted or withdrawn, the door or doors being provided with counter-balancing means, or such like, whereby they can be readily raised or lowered.

The furnace is also so made that the bottom of the melting bath can be heated by the hot gases, a heating chamber and an arrangement of flues being provided for the purpose, and, further, a flue arrangement is provided whereby the carbureter, which is a well known feature in the Burdon oil gas furnaces, may be directly heated by the hot gases from the primary combustion chamber and independently of the heating of the bath. Provision is, or may be, also made whereby the hot gases can be shut off from the melting bath during re-charging.

On the drawings annexed I have shown, by way of illustration or example, one mode of constructing a brass melting furnace in accordance with my invention.

Figure 1 is a sectional elevation of the furnace.

Fig. 2 is a sectional plan, while

Fig. 3 is a vertical cross section on the line A, B, Fig. 1, and Fig. 4 a vertical cross section on the line C, D, Fig. 1.

In constructing the furnace, in accordance with the arrangement shown on the drawings, I provide a low wall or bridge *b* across the heating space or chamber *c* and just in advance of the bath the wall or bridge dividing the chamber into two parts, the first part being the primary combustion chamber *d* and the second part the melting chamber or bath *e*. The cross wall or bridge at the combustion chamber side is inclined or angled more or less, as shown at *f*, according to the manner in which it is desired to deflect the hot gases which impinge upon it from the usual burner *g*. Below the bottom of the bath there is a heating chamber *h* and flues *i*, *i*, are arranged in such manner as to direct a portion of the hot gases from the combustion chamber *d* into the heating chamber *h* from whence they pass upward through the outlet flues *j*. The main portion of the hot gases from the combustion chamber pass upward toward the crown of the furnace (see arrow *x*) and then to the melting bath *e* so as to heat the metal therein and, thereafter, escape by means of back flues j^1 to the main flue. A further portion of the gases from the combustion chamber is directed upward through flues *k*, in the crown of the combustion chamber, so as to heat the usual carbureter *l* and, thereafter, pass away by the main flue *m* or, in some cases, they may be allowed to pass away directly through separate flues or passages *n* regulated by a damper *o* and arranged above the carbureter and over the combustion chamber. The arrows show the various paths followed by the hot gases.

The cross wall *b* prevents direct impingement of the flame upon the metal in the bath and it also reduces the pressure of the hot gases therein. The highly heated gases from the combustion chamber are carried over the top of the wall and distributed

evenly over the bath thereby giving a much more rapid and much more satisfactory melting than heretofore. The flues *j* which are arranged as will be seen, just above the level of the metal in the bath, tend to draw down the hot gases over the top of the metal.

The furnace shown on the drawings is a fixture but, if desired, it may be mounted upon trunnions or pivots and be adapted to tilt, in which case the oil supply and air supply pipes would be flexible.

The improvements can, of course, if so desired, be applied to annealing, case-hardening, and other low temperature furnaces of the type referred to, the cross wall being arranged to separate, more or less, the primary combustion chamber from the heating chamber.

Of course the general construction of the furnace could be altered or varied to suit the metal or metals being melted or the amount thereof to be treated at each charge.

Having now fully described my invention what I claim and desire to secure by Letters Patent is:—

1. A liquid fuel furnace of the type referred to, made with a primary combustion chamber and a melting chamber the chambers being partially separated from one another by a cross wall having an inclined face, a chamber below the floor of the melting chamber and heated by hot gases from the primary combustion chamber, the gases passing downward through the cross wall, then through the lower chamber and thence to the outlet flue.

2. A liquid fuel furnace of the type referred to, made with a primary combustion chamber and a heating chamber the chambers being partially separated from one another by a cross wall, having a bottom heating chamber arranged below the floor of the heating chamber and heated by hot gases from the primary combustion chamber, a passage extending from the primary chamber through the cross wall to the said bottom chamber and a passage extending from thence to the outlet flue.

3. A liquid fuel furnace of the type referred to, made with a primary combustion chamber into which the gases are directed, a heating chamber, a cross wall partially separating the chambers, a bottom chamber below the said heating chamber, an inclined passage extending from the primary chamber to the bottom chamber, an outlet flue from the bottom chamber and an outlet passage from the heating chamber to said flue.

4. A liquid fuel furnace of the type referred to, made with a primary combustion chamber into which the gases are directed, a heating chamber, a cross wall between the chambers, a passage over said wall, a bottom chamber below the said heating or melting chamber, a plurality of passages extending from the primary chamber to the bottom chamber, an outlet flue from the bottom chamber and an outlet passage from the heating chamber.

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

WM. M. BURDON.

Witnesses:
HUGH D. FITZPATRICK,
WILLIAM GALL.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."