O. TROSSIN.

FURNACE.

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1,039,217. Patented Sept. 24, 1912.

Fig. 1.

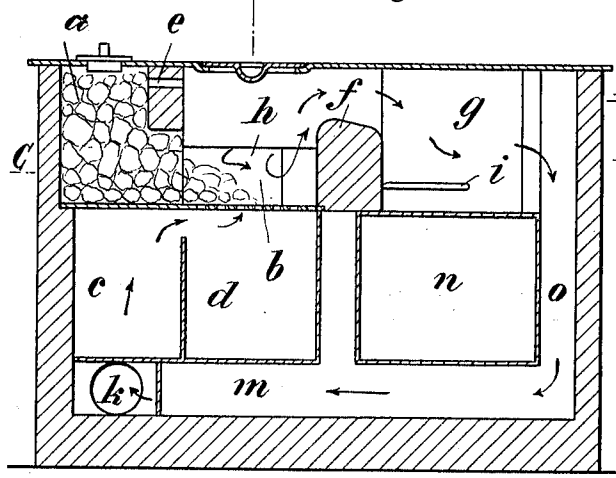
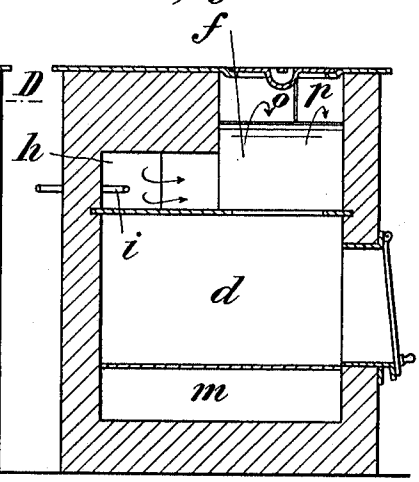


Fig. 2.



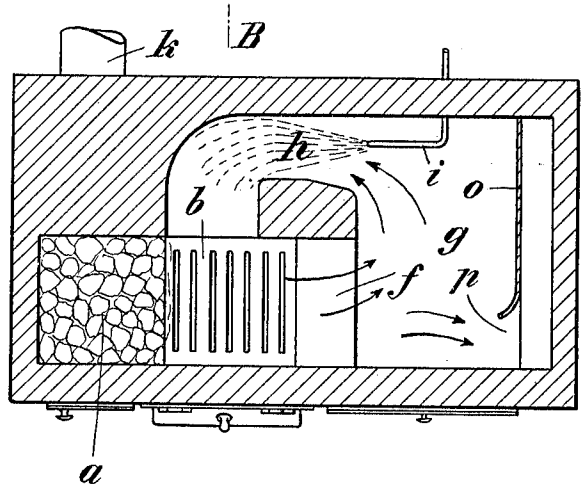


Fig. 3.

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FURNACE.

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Application filed February 25, 1911. Serial No. 610,849.

To all whom it may concern:

Be it known that I, OTTO TROSSIN, a subject of the German Emperor, and resident of Hamburg, German Empire, have invented certain new and useful Improvements in Furnaces, of which the following is a specification.

This invention relates to smoke consuming furnaces of the type wherein the partially consumed products of combustion which pass over the fire bridge, are returned to the combustion chamber above the fire grate through a passage or conduit by the aid of a steam jet or the like.

According to this invention the combustion chamber communicates with a fuel chamber arranged adjacent thereto so that the fuel is wholly or partially distilled by the heat from the combustion chamber, the products of combustion being returned to the fire grate, above the latter, through a conduit or passage by the aid of a steam jet or the like. In this way, after the furnace has been in operation for some time, the fuel chamber may be said to constitute a retort. The thorough combustion which takes place in the fire chamber when the jet is in operation enables the flue or chimney to be partially closed, if desired, for a considerable period, as the quantity of gases passing through this flue is inconsiderable and, as long as the supply of fuel lasts or is regularly maintained, these conditions will prevail.

In the accompanying drawings, there is illustrated a range constructed in accordance with this invention.

Figure 1 is a vertical longitudinal section of a kitchen range, Fig. 2 is a vertical cross-section on the line A—B of Fig. 1, Fig. 3 is a horizontal section on the line C—D of Fig. 1.

The kitchen range shown comprises a fuel chamber *a* arranged adjacent to the combustion chamber *b* from which it is divided by a partition *a'*, an opening being formed in the lower part of the wall *a'* which establishes communication between the chamber *a* and combustion chamber *b*. The combustion chamber *b* comprises a fire grate having an ash pit *d* formed below it, which can be closed by a door if desired, and in the construction illustrated the combustion chamber is divided by a bridge *f* into two parts, the products of combustion passing over this bridge. The two portions of the combustion chamber, namely the fire chamber proper *b* and space *g* behind the bridge, are connected by a conduit or passage *h* into which a jet of steam, compressed air or the like from any suitable source is directed through a nozzle *i*. This jet compels the partially consumed products of combustion which pass over the bridge *f* to return to the fire chamber *b* proper, above the grate therein, where they become ignited, thus increasing the temperature of the fire chamber and effecting the complete or partial distillation of the fuel in the chamber *a*. In some cases one or more openings *e* may be formed in the upper part of the wall *a'* through which the gas given off by the fuel may pass into the combustion chamber. The spent gases which are no longer combustible pass from the chamber *b* through flues *e*, *m* to a chimney outlet *k*. In the construction illustrated a cooking oven *n* is disposed below the combustion chamber and an aperture may be provided through which atmospheric air may pass from a chamber *c* into the ash pit *d* and thence to the fire grate and combustion chamber. The jet which circulates the gases within the combustion chamber, is preferably in the form of steam, and this is conveniently generated in a coil disposed as shown in Figs. 1 and 3 in the portion of the combustion chamber behind the fire bridge, but other arrangements may be employed if found desirable.

In operation a coal fire is started on the fire grate in the usual manner, the door of the ash pit being left open to support combustion. After the fire has been burning for a short time, steam will be generated sufficient to start the jet, and the products of combustion, instead of passing directly to the chimney, will be returned through the passage or conduit *h* to the combustion chamber above the fire grate, where they are ignited and their consumption completed. The temperature of the fuel chamber *a* is thus raised so that its contents are wholly or partially distilled, and the gases evolved are consumed in the combustion chamber, together with the solid fuel on the grate, without further attention being necessary as long as the supply of fuel is maintained.

The relative position of the combustion chamber, return passage and fuel chamber may be varied in accordance with the type

of furnace to which the invention is applied, and the extent to which the fuel in the chamber *a* is distilled may thus be regulated to suit the requirements of the furnace.

It will be understood that the formation and relative levels of the fire grate and combustion chamber may vary and, in a similar manner, the length and disposition of the return conduit may be modified to suit the particular type of furnace to which the invention is applied. For instance, by raising the floor of the chamber behind the fire bridge relatively to the grate, a furnace suitable for smelting purposes is produced.

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

1. In a smoke consuming furnace, the combination of a combustion chamber, a bridge wall or partition extending transversely across and of less height than said chamber, a fuel chamber communicating at its lower end with the section of the combustion chamber in front of the bridge wall, one of the walls of the combustion chamber being provided with a conduit or passage connecting the two sections of said chamber about one end of the bridge wall, means for causing products of combustion passing over the bridge wall to return through said passage to the section of the combustion chamber in front of said wall, and an escape flue connected with the section of the combustion chamber in rear of the bridge wall.

2. In a smoke consuming furnace, the combination of a combustion chamber, a bridge wall or partition extending transversely across and of less height than said chamber, a fuel chamber having at its lower end a fuel discharge opening communicating with the section of the combustion chamber in front of the bridge wall and having near its upper end a gas conduit leading to the same section of the combustion chamber, one of the walls of the combustion chamber being provided with a conduit or passage leading from the rear of the bridge wall to the front thereof, means for causing products of combustion passing over the bridge wall to return through said passage to the section of the combustion chamber in front of said wall, and an escape flue connected with the section of the combustion chamber in rear of the bridge wall.

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