No. 646,978.

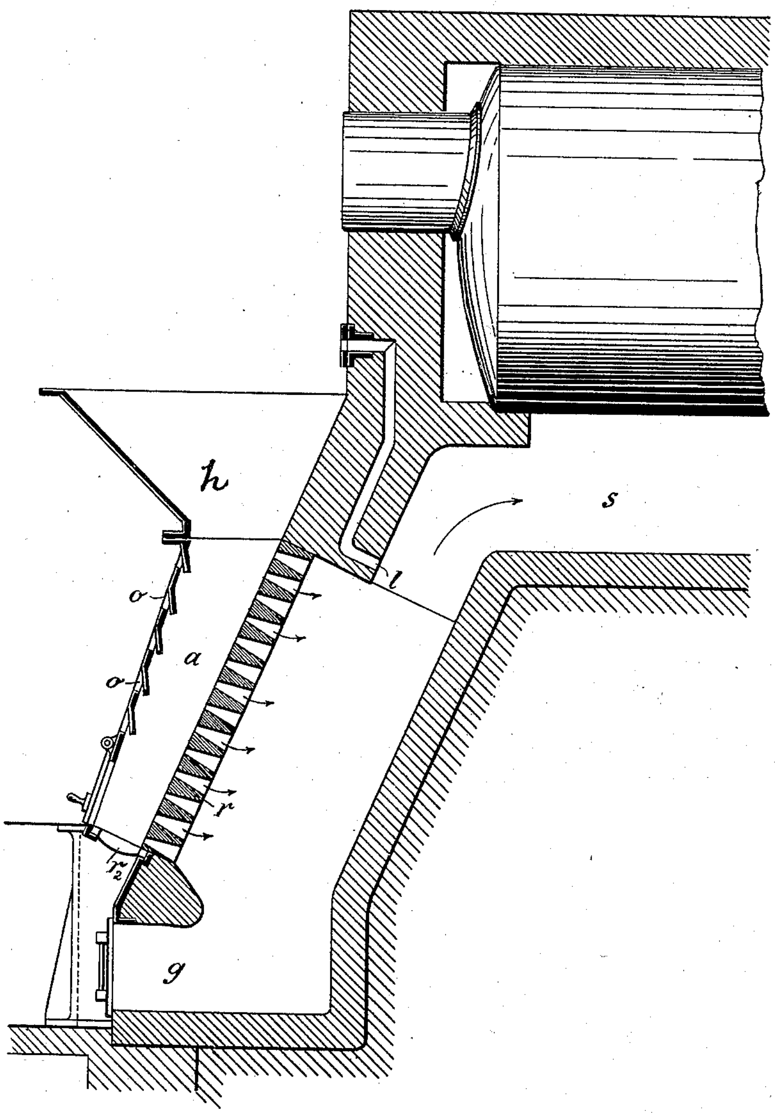
Patented Apr. 10, 1900.

E. GESSNER.

SMOKELESS FURNACE.

(Application filed Mar. 4, 1899.)

(No Model.)



Witnesses

W. F. Stetler

Geo. P. Whittlesey

Inventor

Eduard Gessner

by Alexander & Co

Attorneys

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

UNITED STATES PATENT OFFICE.

EDUARD GESSNER, OF BRÜNN, AUSTRIA-HUNGARY.

SMOKELESS FURNACE.

SPECIFICATION forming part of Letters Patent No. 646,978, dated April 10, 1900.

Application filed March 4, 1899. Serial No. 707,777. (No model.)

To all whom it may concern:

Be it known that I, EDUARD GESSNER, a subject of the Emperor of Austria-Hungary, and a resident of Brünn, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Smokeless Furnaces; and I do hereby declare that the following is a full, clear, and exact description of the same.

The smokeless furnace forming the subject-matter of the present invention consists in conducting the products of combustion (gas and smoke) developed in the combustion of the fuel from above downward through the layer of fuel and the hot grate, whereby they are consumed. There is hereby produced a smokeless furnace perfectly suitable for all combustion processes, which, moreover, carries with it an economical consumption of the fuel. By it it becomes possible to reduce greatly in their dimensions the smoke-stacks of factories, since the draft requisite for the furnace can be produced by exhausters, steam-jets, &c., and the smokeless gases can be discharged at a lower height.

The accompanying drawing shows a device for carrying the invention into practice in a steam-generator or fire-grate using damp fuel.

My smokeless fire-grate consists of the fire-box *a*, which is not in direct communication with the flues *s*, but is separated from them by the steeply-inclined grate *r*, the said grate being provided with fuel through the hopper *h*, having holes *o* opposite the grate. Through these holes air is admitted above the grate at a number of points, so as to insure an even combustion. Air can also enter through the lower grate r^2, which extends forward from the main grate *r* at about right angles thereto. In addition to these, air-passages *l* may be provided in the walls of the furnace to admit the requisite amount of air to insure combustion of the gases passing through the grate *r* into the flues. The air necessary for combustion passes downward and inward through the layer of burning fuel and the red-hot grate and carries with it the products of combustion, which are then burned in the flues. The ash produced and the liquid melted slag collects in the space *g* underneath the grate, whence they can be removed by hand or by mechanical appliances.

Since the grate and the grate-bars are exposed to a very high degree of heat, it is advisable to make them of some good fire-resisting material.

What I claim is—

The combination with a fire-box *a* and flues *s*, of a main fire-grate *r* between the fire-box and the flues and inclined at a steep angle, a front grate r^2 at an angle with the main grate and exposed to the outer air on its under side, a fuel-feeding hopper above the main grate having holes in its lower part opposite said grate, and air-passages in the walls of the fire-box conducting air to a point beyond the main grate, substantially as and for the purpose set forth.

In witness whereof I have hereunto set my hand in presence of two witnesses.

EDUARD GESSNER.

Witnesses:

KARL GLASER,

THEODOR HEMLITSCHKE.