

H. UNTIEDT.
GRATE.
APPLICATION FILED NOV. 25, 1907.

944,524.

Patented Dec. 28, 1909.

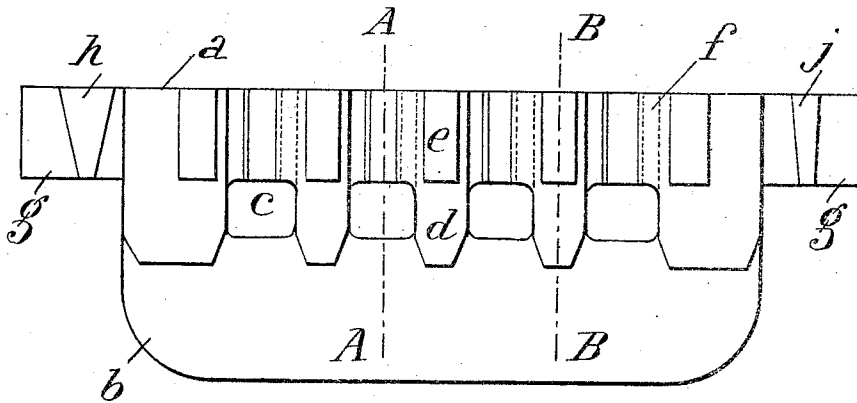


Fig. 1.

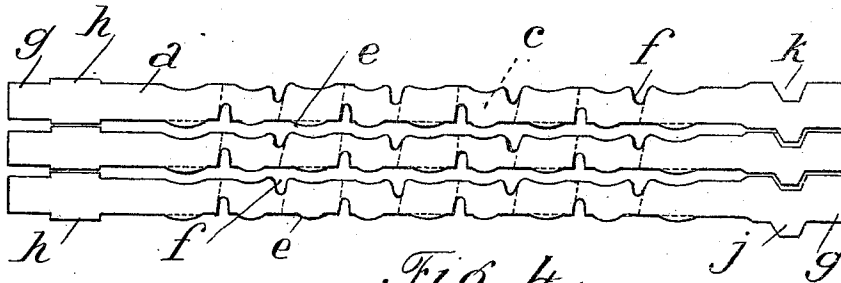


Fig. 4.

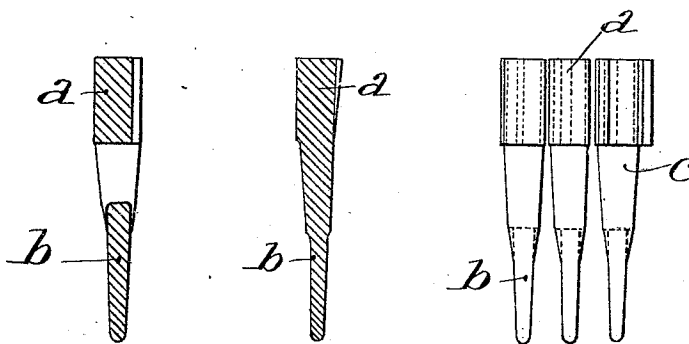


Fig. 2

Fig. 3.

Fig. 5.

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HEINRICH UNTIEDT, OF CASSEL, GERMANY.

GRATE.

944,524.

Specification of Letters Patent.

Patented Dec. 28, 1909.

Application filed November 25, 1907. Serial No. 403,798.

To all whom it may concern:

Be it known that I, HEINRICH UNTIEDT, a subject of the Emperor of Germany, residing at Cassel, in Germany, (whose post address is Ottostrasse 12, Cassel,) have invented new and useful Improvements in Grates, of which the following is a specification.

The present invention has for its object a grate-bar having horizontal transverse openings and vertical ventilating channels in communication therewith, the side faces of said bars having alternately straight and curved portions for the purpose of facilitating the admission of air, of causing a better combustion and of decreasing the weight of the grate and thus lowering the price of the same besides economizing in fuel.

Although numerous systems of similar grates have become known, none has as yet been discovered which entirely meets every requirement, all of them show the disadvantage that, when forced draft or fuel of inferior quality are used, the grate quickly becomes very hot which causes deterioration of the metal and loss of fuel and heavier expenses through the necessity of frequently exchanging the damaged grate-bars which in turn through the delay caused thereby brings about a decrease in the amount of work done.

In the accompanying drawing, showing one form of execution of the grate-bar forming the object of the present invention: Figure 1 is a side view of the grate-bar. Fig. 2 is a vertical section along the line A—A of Fig. 1. Fig. 3 is a vertical section along the line B—B of Fig. 1. Fig. 4 is a plan view of a series of bars, and Fig. 5 an end view of the same.

The grate bar is composed of an upper and a lower part, the latter forming a girder-like strengthening rib *b* and the former the platform *a* of the grate. The middle part of the bar between the upper and lower part has longitudinal horizontal openings *c* arranged in such a way that between two of the openings always remains a web *d*.

The side faces of the upper parts of the grate-bar alternately present a straight portion and a curved portion, and are arranged in such a way that the straight portions are flush with the outer edge of the web and the curved portions on one side of the bar pro-

ject outwardly *i. e.* are convex while at the opposite side the curved portions are concave.

The sides facing and adjoining the platform *a* are provided with triangular notches *f*, the vertex of which is nearly approaching the center line of the bar and always opposite the straight parts of the lateral surfaces.

The notches *f* enlarge gradually from the grate surface downwardly and their widest part below freely communicates with the transverse openings *c*. The webs *d* decrease in thickness downwardly and run out smoothly into the girders *b* which are also decreasing downwardly in thickness. The ends of the bars, supporting the same are so constructed that one has on both sides enlargements *h* while at the other end notches *k* are provided on one side and corresponding projections *j* on the opposite side are made to fit into said notches. Thus the correlation of the bars is well secured while the longitudinal expansion of the bars is not impeded.

The curved faces of the sides of the grate-bars are so arranged that they alternately correspond with the middle of the openings *c* and with the middle of the web *d*.

The grate bar resembles a kind of lattice girder in which the platform *a* forms the upper and the rib *b* the lower beam and the webs *d* the cross-bars.

Experience has shown that lattice girders in consequence of their light weight and their power of resistance are better than solid girders. Besides, when several single bars are juxtaposed to form a grate, their transverse conduits formed in the same by means of the openings *c* in the bars, in combination with the triangular notches *f* branching off therefrom, produce a forced draft of air which constitutes the principal advantage of the grate bar according to the present invention over other similar devices.

The results obtained with the new grate bar may be explained as follows: In order to obtain a good combustion in a furnace it is necessary to convey to the fuel through the grate as much air or oxygen as possible. It is therefore necessary to provide numerous openings for the passage of the air to the fuel and to arrange these passages in such a way that obstruction by slack and

ashes is prevented and to provide lateral surfaces which besides these advantages limit the falling of live coal through the grate. It is also advisable that the material of

5 which the bars are made is of such a quality that the bars do not get completely red-hot and that the clinkers do not form a compact mass.

In the above described device a forced
10 draft of air is formed in the interior of the transverse passages *c*, which through the vertical openings goes into the incandescent fuel and causes an increase of oxygen because the hot air from above mixes with the
15 fresh air from below within the openings and produces an equilibrium of temperatures; the rapidity of the passage of the heated air permits in a certain way no harmful action and introduces also a great quantity of oxygen into the fuel and effects the
20 cooling off of each bar.

The arrangement of the portions alternately straight and curved and of the vertical passages prevents as much as possible
25 the fall of the live coal through the grate, and the openings of the bars cannot be injured when the attendant uses the poker.

In order to admit as much fresh air as

possible to the passages *c* the girders *b* are quite narrow.

Having thus described my invention, what I claim is:—

A grate-bar composed of an upper laterally sinuous part forming a fuel supporting platform, of a lower narrow edged part
35 forming a girder-like strengthening rib, and a middle part between said rib and the platform having a number of horizontal transverse openings throughout its length, the top part being provided on the sides with deep
40 vertical notches in communication with said transverse openings and being placed opposite each other in an alternating order to form the sinuosity of the platform and having
45 on one side of the bar-faces alternately straight portions and concaved portions between said notches and on the opposite side of the bar straight portions and convex portions between said notches, the straight portions being opposite said notches, substantially as described.

In testimony whereof I affix my signature.

HEINRICH UNTIEDT.

In the presence of—

BRUNO BOLAND,

FLORA PATHE.