FURNACE GRATE-BAR.

1,329,447.


To all whom it may concern:

Be it known that I, JOHN VAN BRUNT, a citizen of the United States, residing at the city, county, and State of New York, have invented a certain new and useful Improvement in Furnace Grate-Bars, of which the following is a full, clear, and exact description.

My invention relates to improvements in grate bars and is particularly applicable to tubular grate bars such as shown in Patent No. 818,010, granted to W. R. Wood, April 17, 1906.

It has for its object to produce a grate bar in which the evils of the swelling or blossoming effect, due to high heating or burning of its upper surface, are reduced.

In grate bars for stoker furnaces and the like, it has heretofore been customary to taper the upper portions of the sides slightly so that the upper surfaces of the bars will be separated from one another by a distance greater than the distance between the body portions of the bars. This is done because when the grate bars are in use extreme heat causes the upper surface of the iron to burn somewhat and to swell so as to increase the lateral dimensions, and if the upper portions of the bars were closely adjacent to one another this swelling would cause the bars to bind so as to close the air passages between them and also interfere with their relative movement. With grate bars as now constructed, the only provision made for guarding against the deleterious effects of such swelling has been the tapering above referred to. In accordance with my invention, however, I make additional provision by forming longitudinal grooves in the upper surfaces of the grate bars of such a depth as to extend below the superficial burned portion, so that the swelling which takes place upon that upper surface can in part expand into these additional grooves and be taken up independently of the space left between adjacent bars by the tapering of the sides above referred to.

The following are descriptions of several embodiments of my invention, reference being had to the accompanying drawings, in which:

Figure 1 shows a plan view of a pair of grate bars from a grate embodying my invention;

Fig. 2 is a side elevation of one of said 55 bars;

Fig. 3 is a transverse section of a pair of such bars on line 3—3, Fig. 1;

Fig. 4 is a transverse section of a modification in which a plurality of grooves are employed;

Fig. 5 is a transverse section of a bar embodying my invention and having two upper portions in sliding engagement with one another;

Fig. 6 is a detail of the construction shown in Fig. 5, and

Fig. 7 is a transverse section of a two-groove bar having three upper portions, two of which are in sliding engagement with the third.

Referring more particularly to the drawings, 1—1' are two channeled castings having their upper outer corners 2—2' beveled, and having their upper inner corners also beveled as at 3—3' so as to form a longitudinal groove down the center of the upper surface of the bar, as shown in Fig. 1. These two bars are held together by rivets 4. The castings being channeled form a tubular bar suitable to be used in the stoker described in the Wood Patent No. 818,010 above mentioned.

In the construction shown in Fig. 4, there are three longitudinal castings, 10—10'—10', each of which has both of its upper edges beveled so as to form two grooves 11 between the intermediate casting 10' and the outer castings 10 and 10' and so that the outer castings have external slanting surfaces 12. The two castings 10, 10' are channeled so as to form a tubular bar and are held together by rivets 13.

In the construction shown in Fig. 5 two channeled members 20—20' are held together by rivets 21. The parts 20—20' are provided with abutments 22 which, when the rivets 21 are in place, are held in engagement with one another and act to space the parts 20—20' apart. The part 20 has a laterally extending portion 23, which lies beneath and is engaged by the underside of a laterally extending portion 24 upon the part 20', the engaging surfaces being substantially horizontal. The two parts also have slanting engaging surfaces, as shown at 25, the engaging surface at 25 on the part 20' lying beneath the surface on the part 20.
20 so as to tend to draw the under-surface of the projection 24 against the upper surface of the projection 23. The upper edges of both the sections 20 and 20' are beveled on each side so as to form a bar with a longitudinal groove 26 and external beveled edges. The external beveled edges on two adjacent bars form a flaring mouth for the passage between said bars.

10 In the construction shown in Fig. 7, three castings 30–30'–30" are employed, held together by rivets 31 which pass through all three of them. The sections 30 and 30' are channeled and provided with abutments 32, while the section 30" is provided with abutments 32' and divides the passageway through the bar. The sections 30 and 30' are provided with extensions 33, while the section 30" is provided with extensions 34, which overlap the extensions 33. The lower portions of the sections are provided with inclined engaging surfaces, as shown at 35, the surfaces upon the member 30" lying beneath the surfaces upon the sections 30–30'.

20 so that as the sections are all held together, engagement at this point tends to hold the lower surfaces of the portions 34 against the upper surfaces of the extensions 33. In all the forms shown the bars are tubular and the deleterious effects of the heat are reduced by the provision of the longitudinally extending grooves formed by the opposing beveled faces in the surfaces of adjacent portions of each bar, while in the form shown in Figs. 5 and 7 further provision is made for taking up expansion due to heat by permitting the two parts of a bar to move relatively to one another. The sections of the bars being made of castings 36 and the beveled surfaces forming the grooves coming at the edges of these castings, the complete bars with their longitudinal grooves can be easily formed without machining so as to produce a product which is inexpensive to manufacture and yet has decided advantages when in use.

As will be evident to those skilled in the art, my invention permits various modifications without departing from the spirit thereof or the scope of the appended claims. What I claim is:

1. In a stoker grate a plurality of juxtaposed tubular grate bars spaced apart from one another at their central portions so as to provide air passages, each grate bar having its upper outer edges beveled so as to present surfaces slanting upwardly toward one another forming flaring mouths for said passages and having a longitudinal groove in its upper surface between said slanting surfaces, permitting growth of the tops of the bars in both directions without closing the passage between adjacent bars.

2. A tubular grate bar comprising two castings having longitudinally extending side channels forming the bore of said tubular bar, each casting having its two upper edges beveled so as to present surfaces slanting upwardly toward one another, two of the surfaces on said bars forming a longitudinally extending groove between the other two surfaces.

3. A tubular grate bar comprising a member having in one side thereof a longitudinally extending channel, a member cooperating therewith to form the bore of the tubular bar, the upper portions of said members being spaced apart laterally so as to form a groove in the upper surface of the bar and be adapted to move toward one another under the effect of variations in heat, said members having adjacent to their top portions upwardly and downwardly facing surfaces respectively in engagement with one another, and means for holding said members together.

4. A tubular grate bar comprising a member having in one side thereof a longitudinally extending channel, a member cooperating therewith to form the bore of the tubular bar, the upper portions of said members being spaced apart laterally so as to form a groove in the upper surface of the bar and be adapted to move toward one another under the effect of variations in heat, said members having adjacent to their top portions upwardly and downwardly facing surfaces respectively in engagement with one another, means for holding said members together, and spacers within the bore of the tubular bar, said holding means being located below said spacers.

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