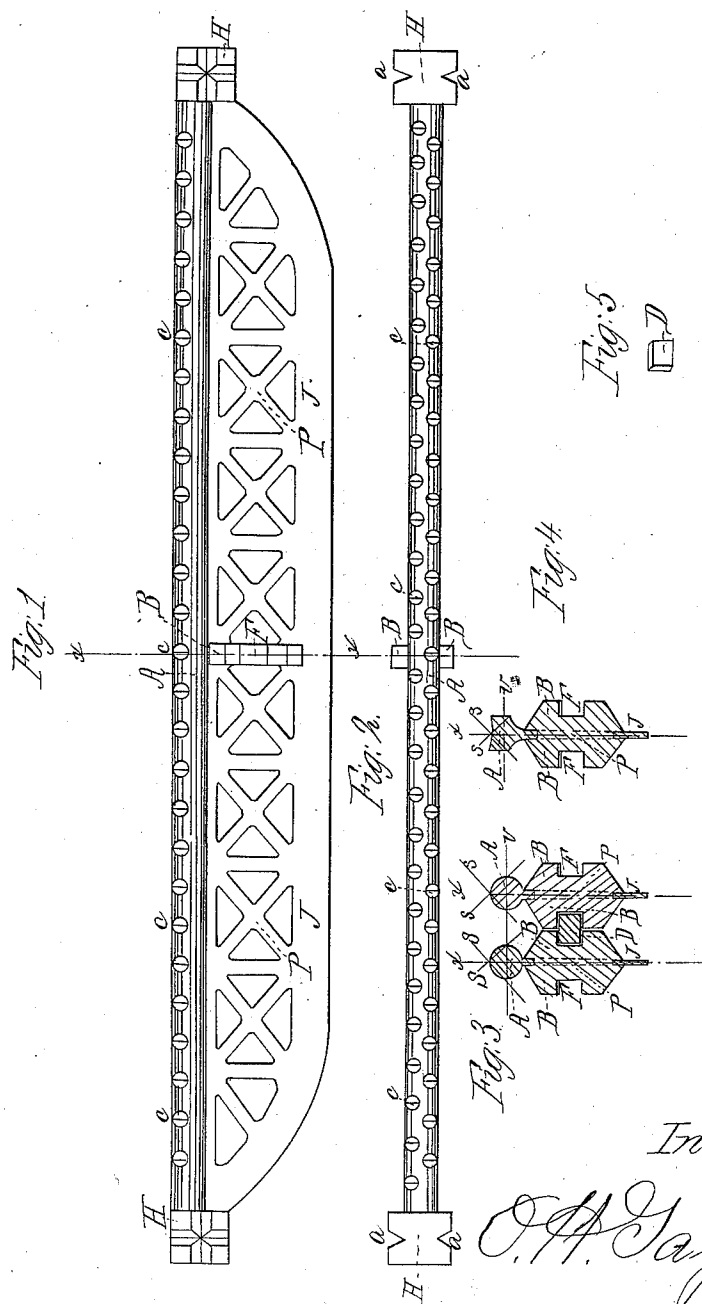


O. H. Taylor,
Furnace-Grate Bar.

N^o 80,574.

Patented Aug. 4, 1868.



Witnesses:

B. Woodard
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O. H. TAYLOR, OF BROOKLYN, NEW YORK.

Letters Patent No. 80,574, dated August 4, 1868.

IMPROVEMENT IN GRATE-BARS.

The Schedule referred to in these Letters Patent and making part of the same.

TO ALL WHOM IT MAY CONCERN:

Be it known that I, O. H. TAYLOR, of the city of Brooklyn, in the county of Kings, and State of New York, have invented new and useful Improvements in Grate-Bars; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and the letters of reference marked thereon, making a part of this specification, in which—

Figure I is a side elevation of my improved grate-bar.

Figure II is a top plan view of Fig. I.

Figure III is a transverse sectional elevation of two bars, showing the manner in which they are secured to each other.

Figure IV is also a transverse sectional elevation of a single bar.

Figure V represents the key by which the bars are secured to each other.

My invention has for its object the construction of a grate-bar, in such a manner, and upon such principles, as to render it far more durable and efficient in its effects, the nature of which consists in making the top of the bar in an oval or round form, and serrating or corrugating the sides at a suitable angle, in combination with a truss and arch-work underneath and pendent to the bar, the said truss-work and arch being cast rigidly to the bar.

It also consists in forming a lock on the sides of the bars, where they rest or form a bearing against each other, in such a simple and novel manner that they may be readily removed; but, while in their position, each bar firmly and rigidly supports its neighbor, thus making a strong and durable fire-grate, from the fact that, by means of the open truss-work, which is essential to the strength and support of the grate-bar, it is kept comparatively cool, for the reason that the current of air rushing through the bars into the fire-chamber also passes more or less through the truss-work.

It will be observed that, by my invention, great strength is given to the support of my bar, as it combines two fundamental principles of architecture, the truss and arch.

To enable others skilled in the art to make and use my invention, I will proceed to describe its construction. Letters of like name and kind indicate like parts in each of the figures.

A represents the top of my improved bar for fire-grate, which is made of cast iron, and may be made in an oval, round, or in the ordinary form, with corrugations or serrations, as shown at *c c c c*, made alternately upon each side of the said bar A, at an angle of about forty-five degrees, so as to permit a free passage of air through the same into the fuel, and thereby facilitate combustion to an extraordinary extent, the said serrations being made in the manner as shown in the drawings.

It will be observed that the corrugations or serrations are made in such a manner as to preserve unbroken the longitudinal line of the bar at the point where the red lines *S S* intersect each other, and, when the bars or grates are arranged in the furnace, also to preserve unbroken the transverse lines, as shown by the red line at *U*, so as not to interfere with the slicing or raking the fire.

It will also be observed that, if corrugations are carried from a point below the line *U* around the top of the bar, it greatly interferes with raking the fire, and thus subjects the fireman to great inconvenience as well as loss of time in keeping his fire in order.

B B represent lugs, made on each side of the bar, so as to form a bearing for the support of each against any lateral movements.

F F represent slots, made tapering, on each side of the lug *B*, for the purpose of admitting the key *D*, shown in Figs. III and V. When the bars are in their proper places, and the said key *D* is inserted, it forms a strong support and lock to the same. In case it is desired to remove any of the bars from the furnace, by simply driving out the keys, releases them, so that they or any one of the bars may be readily removed without disturbing its neighbors.

H H represent the respective ends of the bar *A*, one end of which has a bearing on the bridge-wall, and

the other on the furnace-front, in the common or ordinary manner. In each end of the said bar A, and on the bearings H H, are grooves *a a a*, for the purpose of allowing a better circulation of air.

J J represent the lower portion of the arch, which, together with the truss-work P P, support the bar A. The advantages of the bar A, arch J, and truss-work P P are readily seen from the fact that the greatest amount of strength is gained from the smallest amount of metal; at the same time the bar or any of its component parts are not liable to become overheated, while at the same time it is all cast or made as one piece.

It will be observed that the corrugations or serrations in the top of the bar A are made no deeper than shown by red lines S S, running from the lines X X at an angle to the line U, as clearly shown in Figs. III and IV. The thickness of the truss-work is shown by the dotted lines in Figs. III and IV.

The operation of a furnace, the grating of which is formed with my bars, and the fuel properly arranged over their tops, and supplied with air from their under sides, for the purpose of combustion. The air gains access to the fuel by passing up between the bars in the ordinary manner, but, instead of the fuel lying upon flat or concave edges, as in the case when common grate-bars are used, it lies upon rounded edges on my bars. Said rounded edges being serrated, as shown at *c c c c*, present a very uneven surface to the fuel above, thereby admitting the air to more readily permeate said fuel from underneath; and thus more readily increase combustion.

The form of the top rod of the bar being of much greater diameter than the adjoining margin or truss P P and arch J, the air passes up and comes in contact with the projecting sides of the bar A. It is then deflected at an angle from a vertical line into the fuel. It also has a great influence in keeping the bars cool, and thus the bars are prevented from being overheated and melting down. And, further, the open work of the truss-formation also allows a free circulation of air through the bars; this provision producing a combination of effects that serve in a great measure to protect them in the most perfect manner known.

The serrations or notches on the upper sides are not intended to be made or formed deep enough to reach the centre of the top or sides of the bar A, so that an unbroken line is preserved at those three points or centres, as shown by the red lines U and X X in Fig. III, so that the notches or serrations will not interfere with slicing the fire from above the grates, or raking it from underneath, by the hook or rake being caught in the notches.

It is obvious that the advantages of my invention as set forth are great, from the fact it is simple in its construction, strong, and durable, also greatly facilitates combustion. It is also plain that nearly all these advantages can be attained within the ordinary bar, as will be seen in the transverse sectional elevation, Fig. IV, which shows them cast in one piece, and the formation of the truss-work and notches or serrations on the top corners.

In Figs. III and IV is also seen the lock by which the bars are firmly secured in their respective places, in such a manner as to form one combined grate, which is a great desideratum, in view of the utility and durability of the bars.

I am aware that grate-bars have been made with interlocking lugs, and that grate-bars have been made with transverse and diagonal cuts across their tops, to provide for a better circulation of air under the fuel, but have proved failures, in consequence of the upward-projecting points formed by the said cuts serving as obstructions to the slicing and raking the fire; also their liability to burn off.

I am also aware that pipes have been used or designed for grate-bars, so that they would serve as a water-heating medium in connection with the boiler; so, of course, they have a round form.

I am still further aware that bars have been made with partially-round or oval tops, and corrugations over the tops.

I do not claim any of the above; but

What I do claim, and desire to secure by Letters Patent of the United States, is—

1. The grate-bar A, provided with serrations or indentations upon the upper slope of said bar, as herein shown and described, and for the purposes set forth.
2. Also, the key D, in combination with the slots F F, for the purpose of locking the bars, substantially as shown and described.
3. The combination of the open truss-work with the bar A, provided with serrations, and interlocked by an independent key, when constructed as shown and described, and for the purposes set forth.

O. H. TAYLOR.

Witnesses:

WM. C. LOCKE,
B. WOODARD.