A. WILDERSPIN.

GRATE BAR.

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972,965. **Patented Oct. 18, 1910.**

Fig. 1.

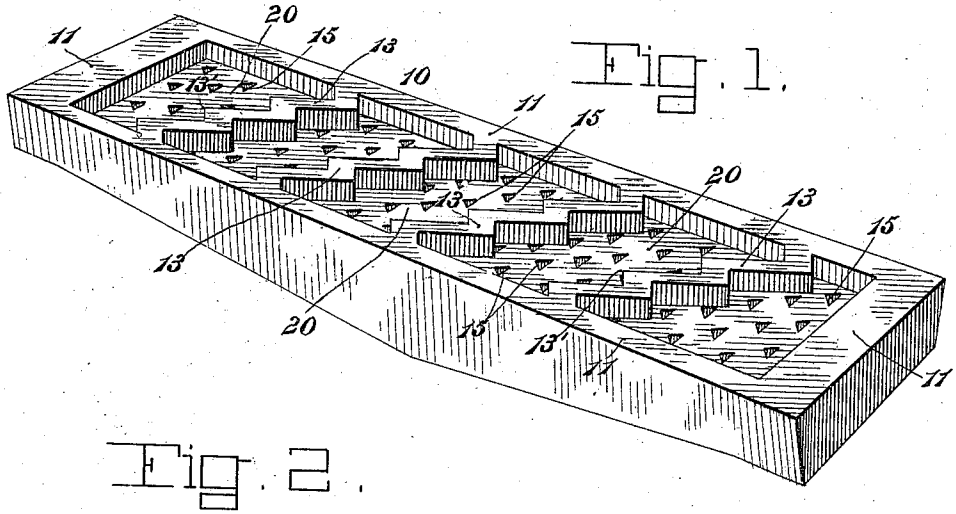


Fig. 2.

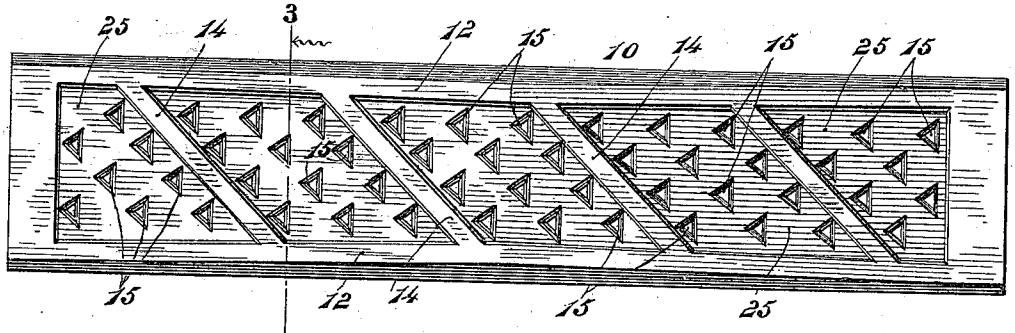


Fig. 3.

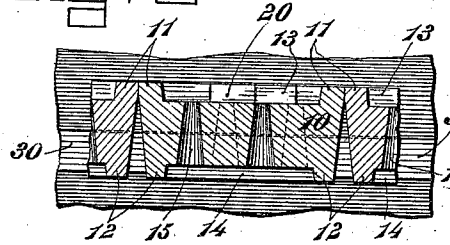
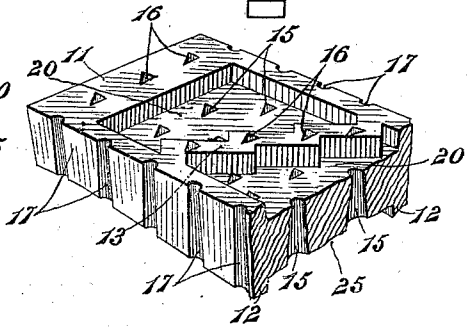


Fig. 4.



Witnesses

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GRATE-BAR.

972,965. Specification of Letters Patent. Patented Oct. 18, 1910.

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To all whom it may concern:

Be it known that I, ANDERSON WILDERSPIN, a citizen of the United States of America, and a resident of Grand Saline, in the county of Van Zandt, in the State of Texas, have invented certain new and useful Improvements in Grate-Bars, whereof the following is a specification.

This invention relates to a furnace grate bar especially adapted for a grate for burning fine fuel such as slack lignite in steam boiler or other furnaces, either with a natural, a forced or an induced draft. These grate bars may also be used to advantage in burning lump lignite and other fuel.

The object of the invention is to provide a grate which affords a thorough distribution of the air to the fuel, which facilitates a rake off and permits a retention by the grate after a rake off of sufficient incandescent fuel to ignite a fresh supply of fuel.

Figure 1 of the accompanying drawings represents a perspective top view of a grate bar embodying this invention. Fig. 2 represents a plan of the under side thereof. Fig. 3 represents a transverse section of the grate bar on line 3—3 of Fig. 2 and of fragments of grate bars adjacent thereto, and an elevation of a fragment of a furnace with its ledge for supporting the grate bars. Fig. 4 represents a perspective view of a fragment of a grate bar embodying this invention.

The same reference numbers in all the figures indicate corresponding parts.

This invention may be embodied in a grate bar of any suitable form. The drawing illustrates the invention as embodied in a grate bar 10 whose general outline is similar to the ordinary grate bar commonly used in boiler furnaces, being approximately rectangular in cross section, wider at top than bottom and tapered in thickness on its under side from its center to its opposite ends.

This grate bar is provided on its top face with a surrounding marginal rim or rib 11 and on its bottom face with a similar surrounding marginal rim or rib 12. The bar is also provided on its top face with transverse zigzag partitions 13 which form a plurality of individual fuel pockets 20 adapted to retain fine fuel, and on its bottom face with transverse partitions or ribs 14 which form air pockets 25. These transverse partitions are preferably diagonal to permit the rake to pass over the grate bar without obstruction. The fuel pockets are preferably about one half to five eighths of an inch deep more or less. The partitions 13 are provided with projections 13′ which have a tendency to break up the fine clinkers when the fire is being raked. These projections are formed by the angles of the zigzag partitions or otherwise.

The fuel pockets 20 are connected with the air pockets 25 by ventilating holes 15 which are preferably tapered and largest at their lower ends. These holes throughout the grate bar are preferably triangular, but they may be round or otherwise in shape.

The grate bar may also be provided with tapering ventilating holes 16 which open flush with the top and bottom faces of the bar and pass through the marginal ribs 18 thereof and through the diagonal partitions as shown in Fig. 4. The grate bar may also be provided on one or both sides with channels 17 adapted to form with corresponding channels on an adjacent bar or bars additional ventilating holes as also shown in Fig. 4.

In the use of these grate bars they are disposed together in touch one with another on ledges 30 or otherwise suitably supported within the fire box as shown in Fig. 3.

The tapering form of the ventilating holes causes a discharge of the air in jets into the fire, and the triangular shape thereof affords a larger heating surface for the air passing through. When the fire is raked, the marginal rim or rib 11 and transverse partitions 13 permit the scraper or rake to pass over the fine incandescent fuel in the fuel pockets 20 and the fuel so remaining in said pockets serves to ignite the fresh lignite or other fuel with which the fire is replenished. The diagonal direction of the ribs and the zigzag form thereof facilitate the raking operation and tend to break up the clinkers.

In ordinary grates especially where a forced or induced draft is used there is a tendency of the air to rush through the weakest places in the fire. In a grate composed of this improved grate bar the individual air pockets underneath tend to prevent the air rushing past some of the ventilating holes and overcharging others. These air pockets form separate sources of supply to the separate groups of ventilating

holes and cause an even distribution of the air to the fuel pockets in the top of the bar throughout the grate surface.

I claim as my invention:

1. A grate bar provided on its top face with a marginal rib and transverse zigzag partitions forming a plurality of individual fuel pockets adapted to retain fine fuel, said bar having ventilating holes extending through the body thereof and opening into said pockets.

2. A grate bar provided on its top face with a marginal rib and diagonal zigzag transverse partitions forming a plurality of individual fuel pockets adapted to retain fine fuel, said bar having ventilating holes extending through the body thereof and opening into said pockets.

3. A grate bar provided with a plurality of individual fuel pockets in its top face, separated by transverse zigzag partitions, individual air pockets on its bottom face and ventilating holes connecting said pockets.

4. A grate bar provided with a plurality of individual fuel pockets in its top face formed by a surrounding rim and by transverse zigzag partitions forming clinker breaking points projecting longitudinally of the bar.

5. A grate bar provided with a plurality of individual fuel pockets in its top face formed by a surrounding rim and by transverse zigzagged partitions forming breaking points projecting longitudinally of the bar, said bar having ventilating holes extending through the body thereof and opening into said pockets.

6. A grate bar provided on its top face with a marginal rib and transverse partitions forming a plurality of individual fuel pockets adapted to retain fine fuel, said bar having ventilating holes extending through the body thereof and opening into said pockets and said partitions having clinker-breaking projections.

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