(No Model.)

W. E. KELLY.

GRATE BAR.

No. 371,329. Patented Oct. 11, 1887.

Fig. 3.

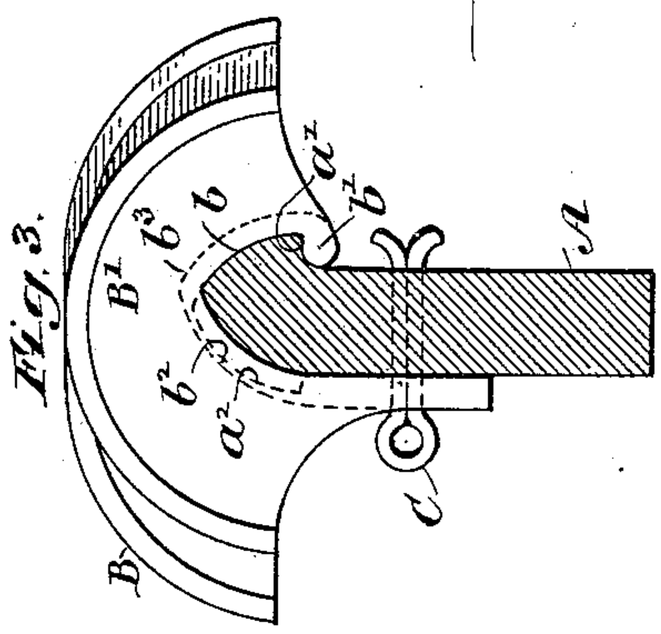


Fig. 6.

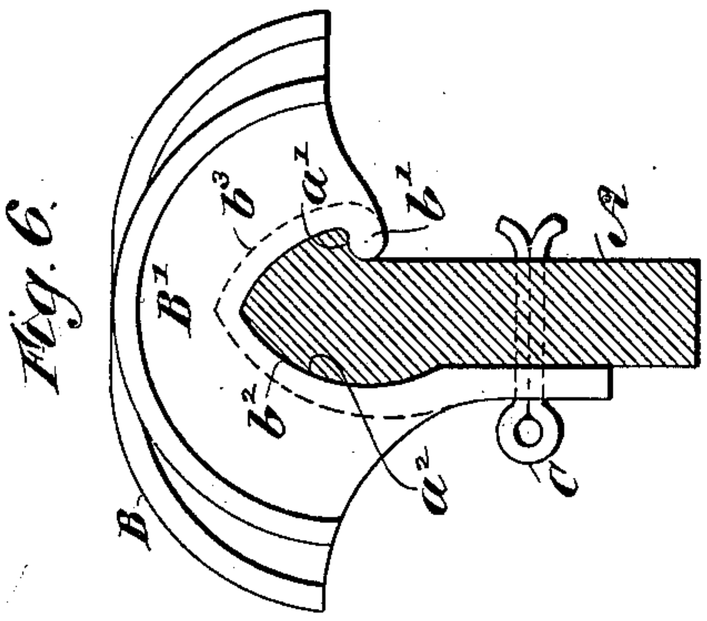


Fig. 2.

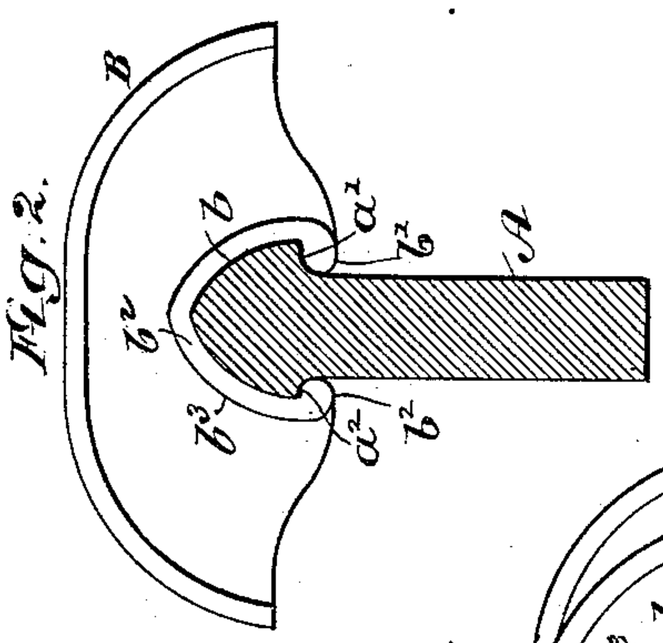


Fig. 5.

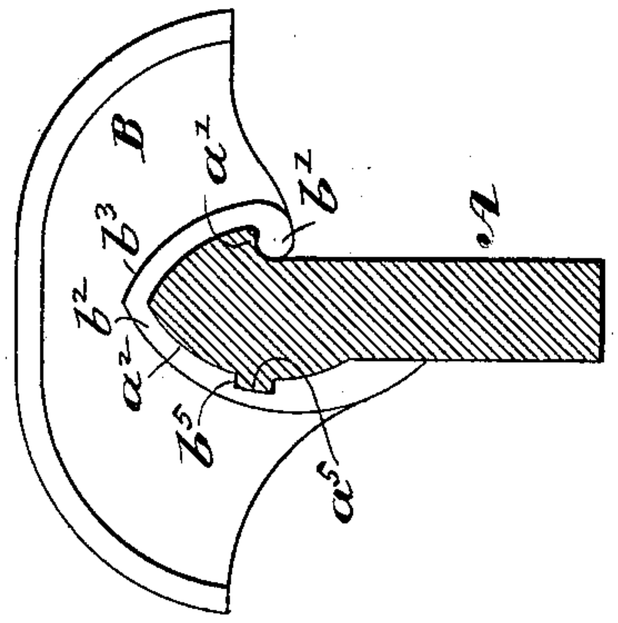


Fig. 1.

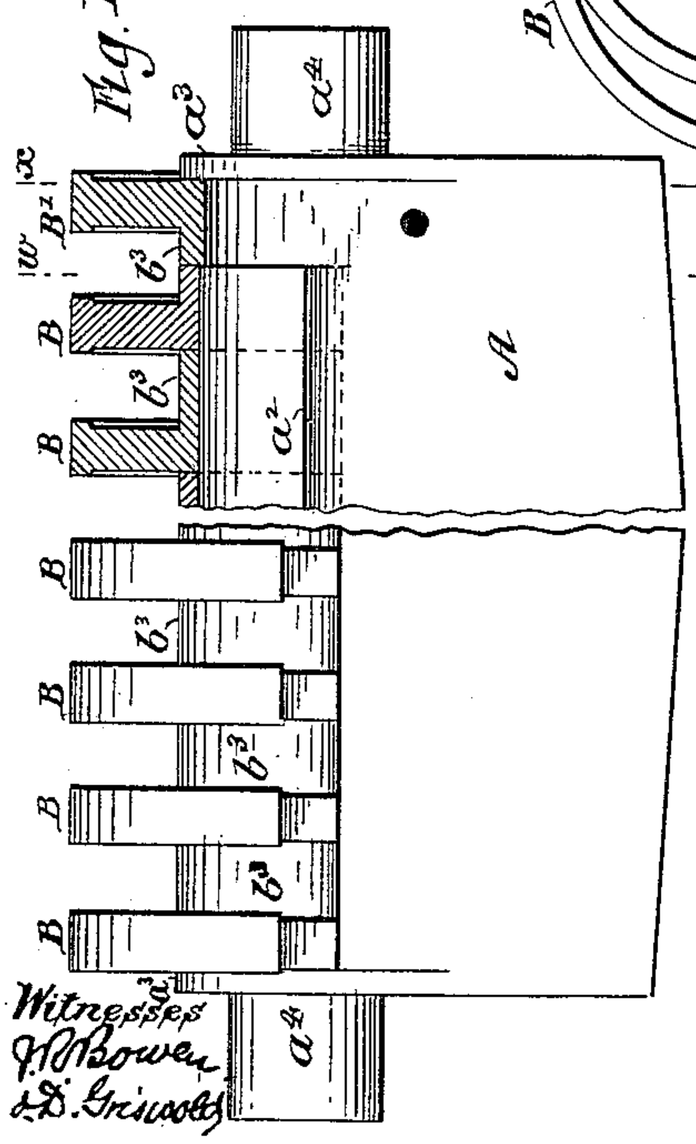
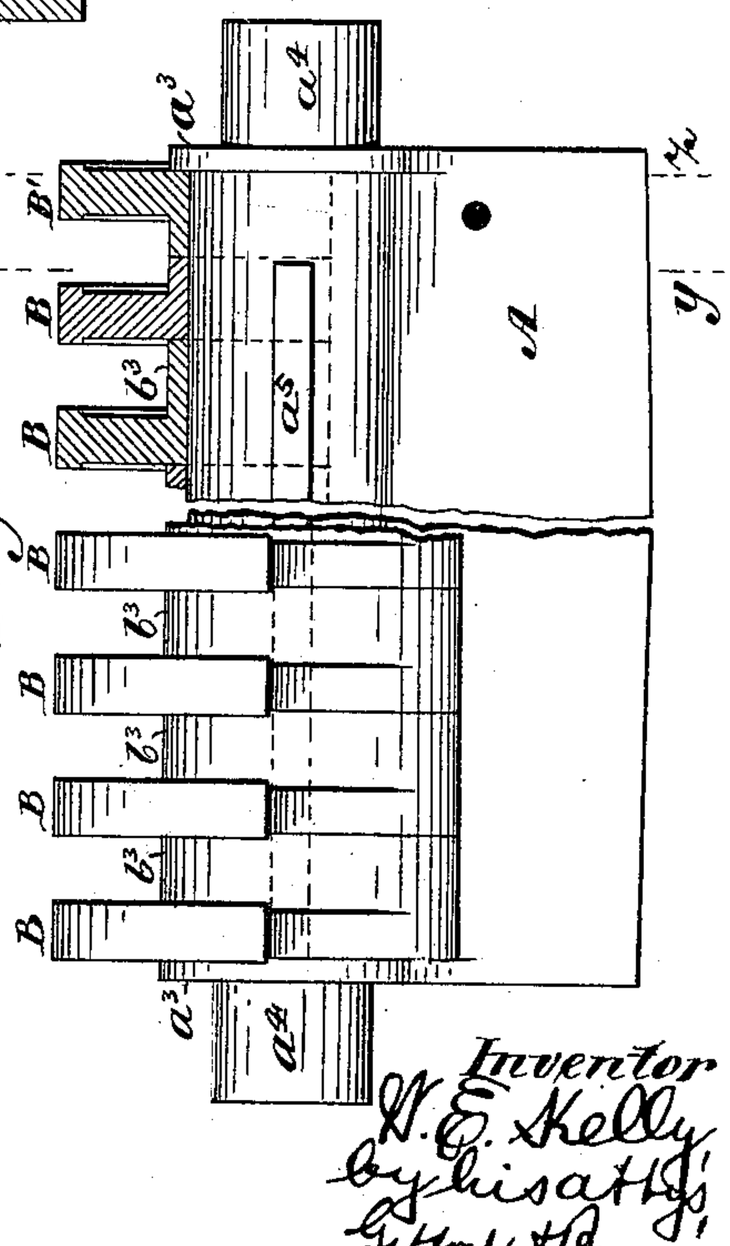


Fig. 4.



Witnesses
W. Bowen
L. D. Griswold

Inventor
W. E. Kelly
by his Att'ys
Gifford & Brown

UNITED STATES PATENT OFFICE.

WILLIAM E. KELLY, OF NEW BRUNSWICK, NEW JERSEY.

GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 371,329, dated October 11, 1887.

Application filed July 8, 1886. Serial No. 207,526. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM E. KELLY, of New Brunswick, in the county of Middlesex and State of New Jersey, have invented a certain new and useful Improvement in Grate-Bars, of which the following is a specification.

I will describe grate-bars embodying my improvement, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a partly-sectional side view of a portion of a grate-bar embodying my improvement. Fig. 2 is a transverse section thereof, taken at the plane of the dotted line *w w*, Fig. 1. Fig. 3 is a transverse section of the same, taken at the plane of the dotted line *x x*, Fig. 1. Fig. 4 is a partly-sectional side view of a portion of a grate-bar of somewhat modified form embodying my improvement. Fig. 5 is a transverse section of this bar, taken at the plane of the dotted line *y y*, Fig. 4. Fig. 6 is a transverse section taken at the plane of the dotted line *z z*, Fig. 4. Fig. 7 is a transverse section of a grate-bar, illustrating a slight modification of the grate-bar illustrated in Figs. 4, 5, and 6. This section is supposed to be taken at the same point as the section illustrated by Fig. 6.

Referring, first, to the grate-bar illustrated by Figs. 1, 2, and 3, A designates the grate-bar proper, and B B′ designate leaves applied thereto and forming the surface for supporting the fuel to be burned.

The bar A may be arched or curved on the lower edge in any desirable manner to afford it the requisite strength at all points, and it may be flat-sided, or approximately so. At the top it is provided with two shoulders, a' a^2, one of which projects from each side, and above these shoulders the sides of the bar converge until they meet at the extreme top of the bar. At the ends of the bar are flanges a^3, which extend not only laterally, but also upwardly and above the main portion of the bar. The bar is also provided at the ends with trunnions a^4 when it is desired to have the capability of rocking. Near one of the end flanges, a^3, the shoulder a^2 is cut away or omitted for such a distance as to leave a space approximately equal to the width of one of the leaves B B′. The surface of the bar where this shoulder a^2 is omitted is curved in the form of an arc struck from a point immediately under the shoulder a'. Some of the leaves B are shown as having flat central upper portions and curved ends extending therefrom. Others are arc-shaped. The under sides may be of any desired shape, except that they must be provided with notches or openings corresponding with the upper portion of the bar A where the latter is provided with the two shoulders a' a^2. These leaves B B′, therefore, have notches or openings b, composed in the main of arc-shaped surfaces converging to the apex. At the bottoms the leaves B are contracted by inwardly-extended rounded portions b' b^2, corresponding to the shoulders a' a^2 of the bar A, while the leaves B′ have inwardly-extended rounded portions b', corresponding to the shoulders a'. These leaves B may be fitted to and secured upon the bar A by taking each one separately, inserting its portion b' under the shoulder a' of the bar A, and then rocking the leaf as on a center, so that its portion b^2 will swing over that portion of the side of the bar A which is between the end of the shoulder a^2 and the adjacent end flange, a^3. After the leaf has thus been adjusted, it is to be slid along the bar A, so that its portion b^2 will extend under the shoulder a^2. These leaves B are one after another fitted to and secured upon the bar A. Obviously, after being thus disposed, the shoulders a' a^2 of the bar will hold them securely in place.

The leaf B′ is like the leaves B, except that its opening is somewhat different from the others in that it has no such portion b^2 as they have, and has an opening which corresponds with the transverse section of the bar A at that point which is located between the end of the shoulder a^2 and the adjacent end flange, a^3. The leaf B′ prevents the leaves B from movement lengthwise of the bar, consequently precluding them from becoming detached. The leaves B B′ have flanges b^3 extending from their sides. As shown, each leaf has but a single flange b^3, and this flange b^3 of course extends but from one side. These flanges b^3 form spacing-pieces, whereby the leaves will be kept at the proper distance apart to allow of the free passage of air between them. These flanges also protect the top of the bar A from the fuel. The leaf B′ is prevented from being rocked over the top of the bar A by means of a pin, C, passing through it and the bar A.

It will be seen that the portion b^2 of the several leaves B forms a hook, engaging with the shoulder a^2 of the bar A and precluding the

leaves from being swung over, so as to disengage them from the bar. In the example of the improvement shown in Figs. 4, 5, and 6 the grate-bar A is substantially like the grate-bar A previously described, except that the curved upper portion of one side is continued farther toward the bottom edge of the bar and has a rib, a^5, extending from it. The leaves B shown in this example of my improvement are very similar to those described in connection with Figs. 1, 2, and 3, except that on one side their openings are provided with transverse grooves or notches b^5, and that on this side of the opening said leaves are extended farther downwardly, so that when in place upon the bar A they will have a more extended bearing thereupon. The rib a^5 does not extend quite to one end of the bar A, but is terminated at such distance therefrom as to leave between it and the end flange, a^3, located at this end of the bar, a space about the width of one of the leaves. Each of the leaves B is applied to the bar A in a position opposite this space and with its inwardly-extending portion b' fitted below the shoulder a' of the bar. Then it is swung, as upon a pivot, until the other side of its opening is adjacent to the opposite side of the bar. After this it is slid along away from the adjacent end flange, a^3, of the bar, and in this way its groove or notch b^5 is made to engage with the rib a^5 of the bar. It will then be securely retained in place.

The leaf B′ in this example of my improvement is just like the leaf B, except that its opening has not any notch b^5, and therefore exactly corresponds to the transverse contour of that portion of the bar A which is between the end of the rib a^5 and the adjacent end flange, a^3, it being designed to fit upon this part of the bar. It prevents the movement of the leaves B lengthwise of the bar, and therefore retains them in place. It may be secured in place by a pin, C, passing transversely through it and the bar A, or by any other suitable means which will prevent its being swung over the top of the bar upon its inwardly-extended portion b' as upon a pivot.

The bottom of the groove or notch b^5 in each of the leaves B in effect forms a hook, which, by engagement with the rib a^5 of the bar, prevents the leaves from being moved off the bar.

In the example of my improvement shown in Fig. 7 the bar A and the leaves B are substantially like those shown in Figs. 4, 5, and 6; but instead of having a rib a^5 upon the curved portion of one side the bar A has a flat or tangential downward extension, a^6, from the curved portion of one side. This portion a^6 at the lower end joins the flat side of the bar, abruptly forming the shoulder. The under side of the shoulder is shown as inclined. The opening of each of the leaves B which are used in this example of my improvement has a flat extension at one side terminating in an inwardly-extending portion, b^6, forming a hook. The tangential extension or shoulder a^6 terminates at such distance from one of the end flanges, a^3, as to provide for the rocking of each of the leaves B into place in the same way as in the preceding examples of my improvement. The shape of this portion where the shoulder a^6 is omitted is indicated in bold outline in Fig. 7. The leaf B′ used in this example of my improvement is secured in place by a cross-pin, C.

It will be seen that in all examples of my improvement shown the leaves B B′ have a terminal pivotal portion on at least one side.

The various parts of the grate-bars which I have described may be made of cast-iron. Should one of the leaves become broken or otherwise impaired, it can be replaced by another, if the leaf B′ of the grate-bar in which it was used be detached to admit of the insertion of another and afterward reattached. An entire new set of leaves may of course be applied to a grate-bar at one time. The leaves will protect the grate-bars from excessive heat, and consequently from warping.

Preferably, the leaves B B′ of the grate-bars will have laterally-extending flanges, so as to make them wider at the top than below, in order that any fuel which may pass the top will have free clearance below.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. The combination, with a grate-bar having throughout a portion of its length laterally-extending shoulders and another portion where one of said shoulders is omitted, of leaves having on one of their sides pivotal projections adapted to be placed under and in engagement with one of the shoulders on the bar, and then swung over the bar and secured upon the opposite side thereof, substantially as specified.

2. The combination, with a grate bar having throughout a portion of its length laterally-extending shoulders and another portion where one of said shoulders is omitted, of leaves having on one side pivotal projections adapted to be placed under and in engagement with one of the shoulders on the bar and swung over the top of the bar and secured upon the opposite side thereof, one of said leaves being secured to the bar by a pin or key, substantially as specified.

3. The combination, with a grate-bar having throughout a portion of its length laterally-extending shoulders, another portion where one of said shoulders is omitted, and having its sides curved convergently above said shoulders, of leaves having on one side pivotal terminal portions adapted to engage one of the shoulders on the bar and provided with openings corresponding to the curved upper portion of the bar, substantially as specified.

WILLIAM E. KELLY.

Witnesses:
D. H. DRISCOLL,
M. FOWLER.