

(No Model.)

N. RUGER.  
GRATE BAR.

No. 343,922.

Patented June 15, 1886.

Fig. 2.

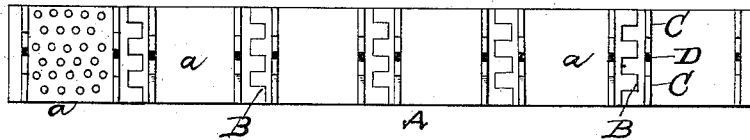


Fig. 1.

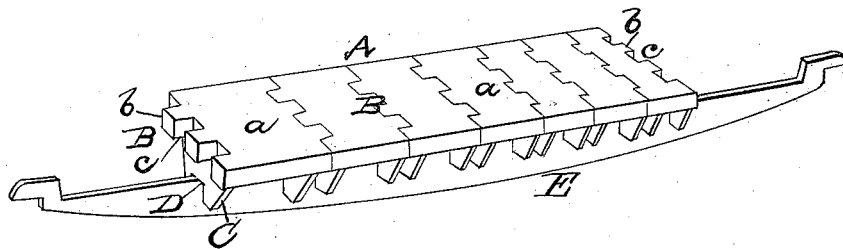


Fig. 3.

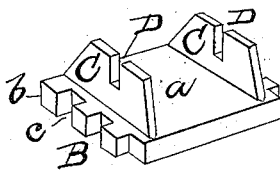
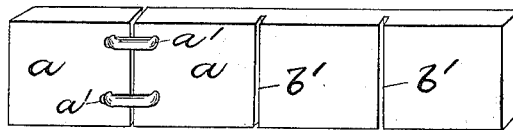


Fig. 4.



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# UNITED STATES PATENT OFFICE.

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## GRATE-BAR.

SPECIFICATION forming part of Letters Patent No. 343,922, dated June 15, 1886.

Application filed November 12, 1885. Serial No. 182,574. (No model.)

*To all whom it may concern:*

Be it known that I, NELSON RUGER, a citizen of the United States of America, residing at Wilkes-Barré, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Grate-Bars; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

This invention relates to improvements in grate-bars for furnaces.

It consists in forming the bars with depending lugs, which at their upper portion are solid and at their lower portion are slotted to permit of their resting upon, fitting, and straddling and gripping the rib, and also of allowing for expansion and contraction.

It also consists in forming the bars in sections, each section being formed with a tongue and groove or other suitably-shaped end or ends, whereby the respective sections may be interlocked and readily separated whenever it may be desired.

In the accompanying drawings, Figure 1 represents in perspective a portion of one of my improved grate-bars in position upon the grate-rib. Fig. 2 represents an under plan view of one of my grate-bars. Fig. 3 represents one of the sections separately. Fig. 4 represents a modified form.

A represents my improved grate-bar, which, as represented in the drawings, may be either perforated or plain, and is formed in sections, *a*, any number greater than two of which may be employed in constructing the bar. I prefer that the bar be made of more than two sections, as thereby, whenever a portion of the bar becomes damaged by being burned out or warped by the fire or otherwise injured, a smaller portion of the bar will require to be removed and replaced by another portion than would be the case were the sections longer. By forming the bars in sections, as represented, a great saving is secured over grates where the bars are formed in continuous lengths, as it frequently happens in use that the bars become warped or otherwise injured in parts,

and when the bars are formed in continuous lengths it becomes necessary to replace the entire bar, while by forming the bar in sections only that portion that is injured need be replaced, thus effecting a saving of material, time, and money. Each section is formed at one or both of its ends, as the case may be, depending upon the position of said section relatively to the remaining sections constituting the bar, with a groove-and-tenon joint, *B*, consisting of lugs *b* and recessed portions *c*, by means of which the respective sections are interlocked and securely held connectedly in position. Depending from the under face of each section, and preferably near each end thereof, are lugs *C*, each having a slot, *D*, extending upwardly from its lower end. These lugs are, with the exception of the slot *D* at their bottom, formed solid, and at their upper portion extend transversely across each section from edge to edge thereof, so as to form a firm bracing-support thereto, and they extend downward to the bottom at a gradually-decreasing angle and width, by which construction, while they afford an effectual bracing-support to the sections, they are removed from contact or interference with the adjacent sections and lugs, and leave a free space between such adjacent portions. The bearing bar or rib *E* is formed of a single bar with plane side faces and of a thickness corresponding with the width of the slots *D*; consequently when the sections are placed in position the depending slotted lugs straddle and snugly fit and grip said rib or bar, and are firmly held thereon without necessitating the employment of any means or devices on or connected to the bearing bar or rib to retain said lugs in position thereon. By my improved construction the sectional grate-bar is securely yet removably connected with the rib and firmly supported thereon. Furthermore, the lugs *C*, which may be cast or otherwise formed integrally with their respective sections or constructed separately therefrom and riveted or otherwise attached thereto, operate to brace, strengthen, and support the sections adjacent to their connecting-joints. By forming the lugs *C* with slots they will not become warped by any expansion and contraction thereof caused by the heat of the fire. By means of the slotted lugs the several sec-

tions can be very readily placed in and removed from position upon the supporting-rib E. Thus any or all of said sections can readily be removed from the supporting-rib without in any manner disturbing said rib, as all that is necessary to secure the placing of the sections in position is to push the slotted portion of the depending lugs down upon and over the supporting-rib, and when it is desired to re-  
 10 move either of the sections to simply raise them from said rib. By thus constructing grate-bars they can be formed to extend the entire length of the supporting-rib E, instead of rendering it necessary to construct the bars  
 15 of several disconnected lengths.

In the illustration shown in Fig. 4 of the drawings, which represents a plan view of a modified form of grate-bar, the bar may be either formed in sections throughout its length, and said sections secured together by staples  
 20 *a'*, passed through the holes in said sections and clinched thereto, or it may be made either partly in sectional form and partly or entirely continuous, except that transverse grooves *b'*  
 25 would be formed therein, said grooves extending downward for a portion of the thickness of the bar, for the purpose of allowing for the contraction and expansion of the bar and preventing the warping thereof out of usable  
 30 shape, the advantages secured by such construction being, that, if desired, the bar can be very cheaply made in one length from end to end or in only two or three pieces, as desired.

The respective sections may be either perforated or plain, as desired. In the drawings I have shown only one section as perforated;  
 35 but it is evident that such perforations may be formed in all or any number of the sections, according to requirement.

40 I am aware that it has been proposed to construct a grate with a double bearing-bar and with grate-bars in sections connected together by tongue-and-groove joints, and hav-

ing lugs adapted to fit between the double bearing-bars.

I am also aware that it has been proposed to construct a grate with a bearing-bar having lugs on its side faces, and with a sectional grate-bar, the sections disconnected at their ends, but having depending slotted lugs adapted to loosely embrace said bearing-bar and rest against the lugs on the sides thereof. I am not, however, aware that any grate has been constructed, before my invention thereof, with a bearing-bar formed of a single rib and a grate-bar formed in sections adapted to interlock together at their respective ends, and having depending lugs formed with solid  
 55 bracing upper portions and slotted lower portions which straddle and snugly fit and grip the bearing-bar.

Having thus described my invention, what I claim is—

1. A grate-bar formed of two or more sections, each section being adapted to interlock with the adjacent section, and having depending lugs, each having a solid bracing upper portion and a slotted lower portion adapted to straddle and snugly fit and grip the bearing-bar.

2. A grate comprising a plurality of bearing-bars, each formed of a single rib, and a plurality of sectional grate-bars, the respective sections being adapted to interlock with the adjacent sections, and having depending lugs having a solid upper portion to brace the sections, and a slotted lower portion straddling and gripping the bearing-bar, substantially as set forth.

In testimony whereof I affix my signature in presence of two witnesses.

NELSON RUGER.

Witnesses:

GEO. A. WELLS,  
 DANIEL A. TELL, Jr.