(No Model.)

R. ROSE.

GRATE BAR FOR FIRE ENGINES.

No. 410,929. Patented Sept. 10, 1889.

Fig. 1.

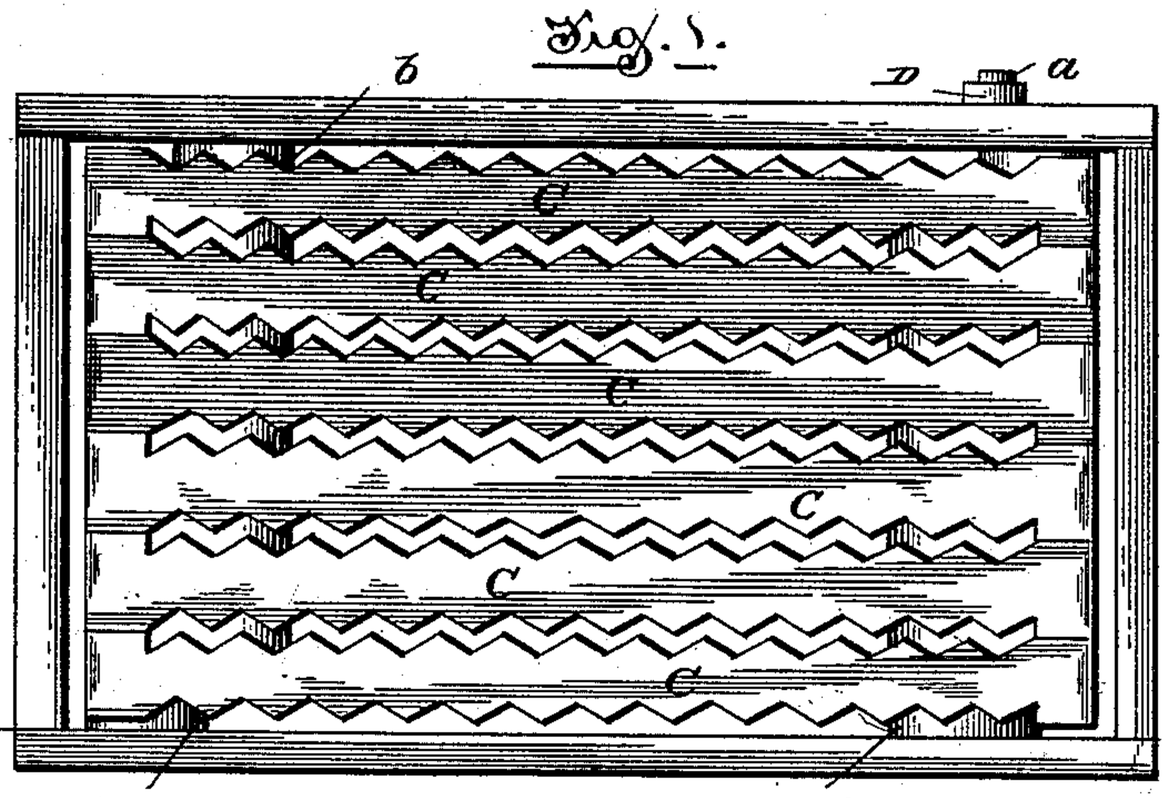


Fig. 4.

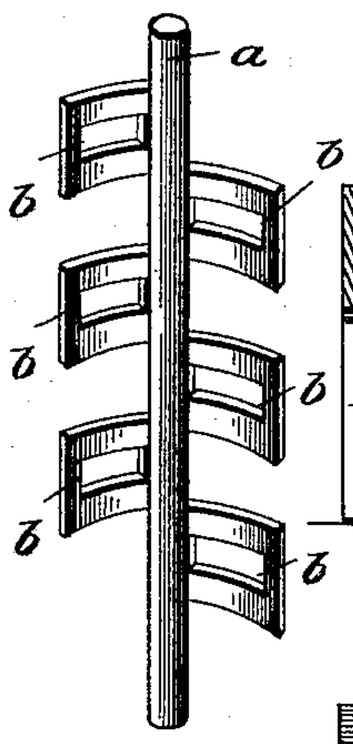


Fig. 2.

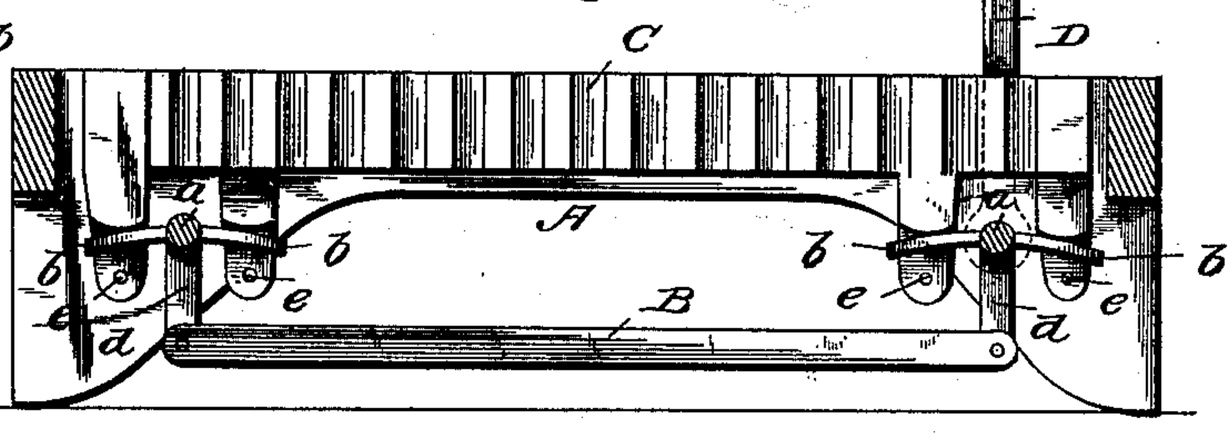


Fig. 5.

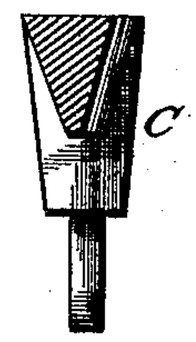
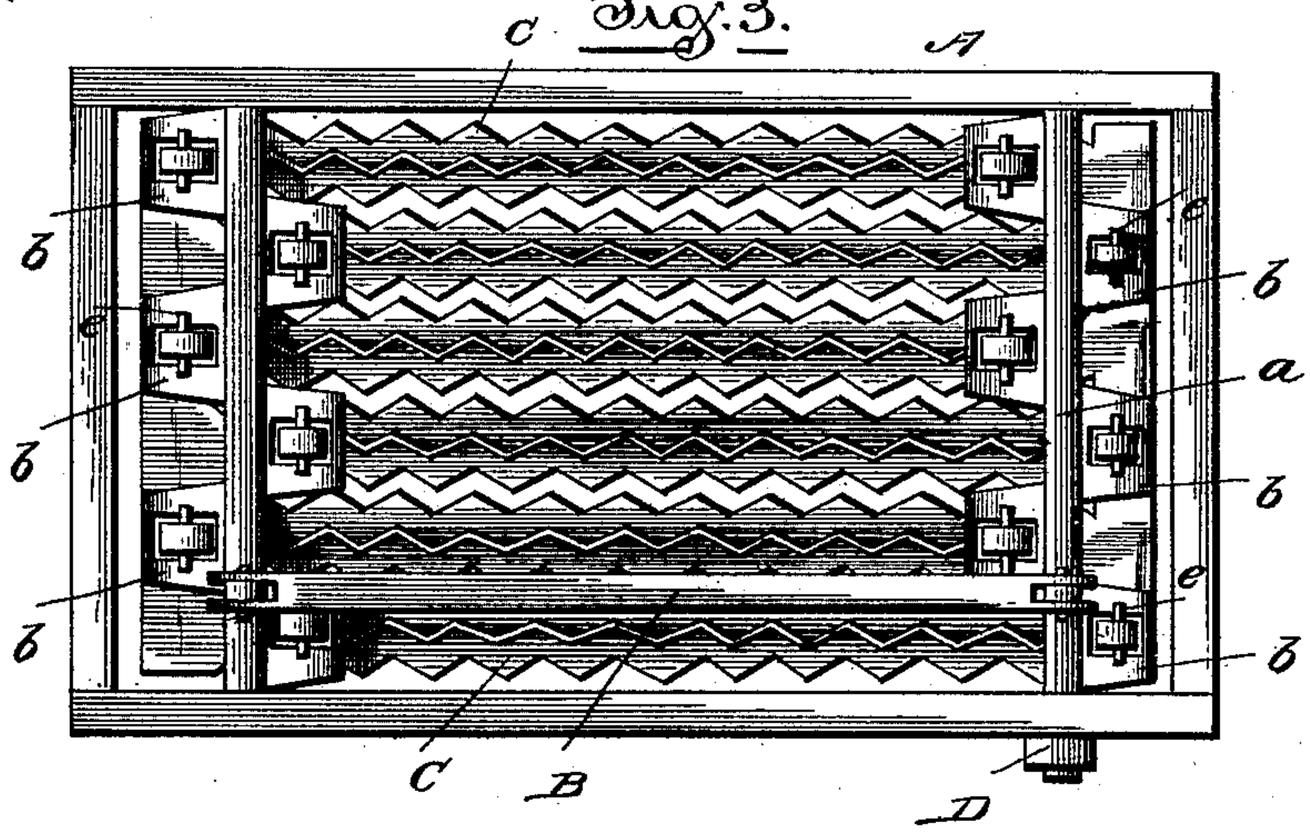


Fig. 3.



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UNITED STATES PATENT OFFICE.

ROBERT ROSE, OF CALLIOPE, IOWA.

GRATE-BAR FOR FIRE-ENGINES.

SPECIFICATION forming part of Letters Patent No. 410,929, dated September 10, 1889.

Application filed October 17, 1888. Serial No. 288,410. (No model.)

To all whom it may concern:

Be it known that I, ROBERT ROSE, a citizen of the United States, residing at Calliope, in the county of Sioux and State of Iowa, have invented certain new and useful Improvements in Grate-Bars for Fire-Engines; and I do 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.

This invention relates to improvements in furnace-grates, and the novelty will be fully understood from the following description and claims when taken in connection with the accompanying drawings, in which—

Figure 1 is a plan view of my improved furnace-grate constructed according to my improvements. Fig. 2 is a vertical sectional view taken in the plane indicated by the dotted line *x x* of Fig. 1. Fig. 3 is an inverted plan view. Fig. 4 is a perspective view of one of the rock-shafts removed, and Fig. 5 is a cross-sectional view of one of the grate-bars.

Referring by letter to the said drawings, A indicates a frame, which may be that of any fire-box adapted to support the grate. Journaled at opposite ends of this frame and in the side walls thereof are rock-shafts *a*. These rock-shafts are of a peculiar form, having alternating bearings or loops *b*, to which the opposite ends of the respective grate-bars are secured, and the rock-shafts are each provided with a depending arm *d* for the attachment of a connecting-bar B.

C indicates the grate-bars, which are also of a peculiar construction, having zigzag sides so formed that the projection of one bar will lie at a point directly opposite the cut-out portion of the opposite bar and partly within the same, and when the bars are placed in position in the grate such projections will alternate. These grate-bars are also of a tapering form—that is to say, they taper from above downwardly—the object of which will be presently explained. The bars are furthermore provided with means for securing them in the loops or bearings of the rock-shafts, and in the present illustration I have shown the bars as provided with a depending arm at opposite ends to enter the loops *b*, and be secured by a cross-pin *e*, although I do not wish to confine myself to this precise means.

It should be here remarked that while the projections on the side of one bar are at points opposite the cut-out portions of the adjacent bar and partly within the same, yet they do not come so close together as to prevent the vertical vibration of each other in operation.

The bars and rock-shafts should be so arranged within the furnace that the bars may have a slight longitudinal play. One of the rock-shafts is provided with a hand-lever D for the grasp of the operator, which when reciprocated will impart a reciprocating motion to the grate-bars, at the same time giving them a vertical vibration. It will thus be seen that by having the grate-bars tapering and corrugated when they have been reciprocated they will have a grinding action upon the cinders, so that the latter will not choke between the bars, but may be ground to a certain extent and together with the ashes deposited in the ash-box beneath.

I am aware that it is not new to provide a rock-shaft with alternating arms to furnish bearings for grate-bars, whereby they may be reciprocated in opposite directions.

I am also aware that grate-bars have been provided on opposite sides with teeth or projections, the teeth being so arranged that those of one bar will come opposite the space between the teeth of the adjacent bar; but I am not aware that any one has ever made a grate-bar of the form I have here illustrated, viz: a bar having its opposite sides of serpentine or corrugated form and tapering from above downwardly, the bars thus formed being placed in such a position that the projection on the side of one bar will come at a point opposite the cut-out portion of the adjacent bar. Now, by having the bars tapering and of the form described, when vertically reciprocated in opposite directions, the projection of one bar will partly enter the cut-out portion of the opposite one. This will cause a grinding action upon clinkers and

coals falling between the bars and effectually serve to remove the same and give a free passage for a draft to the fire.

Having described my invention, what I claim is—

1. A furnace grate-bar having its opposite sides of serpentine or corrugated form, and the projected and cut-out portions both tapering from above downwardly the depth of the bar, whereby, when two bars are placed in position and reciprocated in opposite directions, a grinding action will be caused on clinkers or the like coming between them, substantially as specified.

2. A furnace grate-bar having its opposite sides of serpentine or corrugated form, and the projected and cut-out portions both tapering from above downwardly the depth of the bar, in combination with a furnace, the rock-shafts having bearings for said bars, the bar connecting the rock-shafts, and a lever for rocking one of the shafts, substantially as specified.

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

ROBERT ROSE.

Witnesses:

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