H. B. DENNY.

GRATE-BARS.

No. 188,867. Patented March 27, 1877.

Fig. 1.

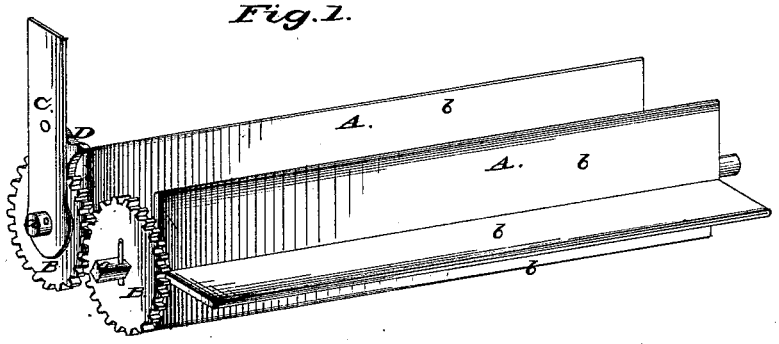
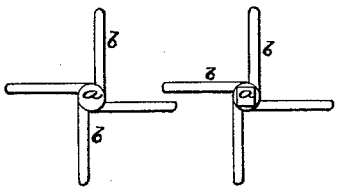


Fig. 2.



Witnesses:
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UNITED STATES PATENT OFFICE.

HERVEY B. DENNY, OF CIRCLEVILLE, OHIO, ASSIGNOR OF ONE-HALF HIS RIGHT TO HENRY W. RUTH, OF SAME PLACE.

IMPROVEMENT IN GRATE-BARS.

Specification forming part of Letters Patent No. **188,867**, dated March 27, 1877; application filed January 2, 1877.

To all whom it may concern:

Be it known that I, HERVEY B. DENNY, of Circleville, in the county of Pickaway and State of Ohio, have invented certain new and useful Improvements in Grate-Bars, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, and to the letters of reference marked thereon, which form a part of this specification, in which—

Figure 1 is a perspective view of two bars, showing improved means for operating the same. Fig. 2 is an end view of two bars, showing the manner in which they are arranged.

The object of my invention is to provide an improved grate-bar, applicable to stoves and furnaces of all kinds, and capable of burning the different varieties of fuel, from the coarsest to the finest, without much loss, and also for furnishing a ready and efficient means for the removal of clinkers and ashes from the grate, for securing a free circulation of air through the fire; and it consists of a grate-bar provided with four wings or lugs, which stand at right angles from each other, and adapted for operation through the medium of cog-wheels, and a lever and pawl on the outer ends of the said bars, all as will be hereinafter more fully described, and pointed out in the claims.

Referring to the drawings, A represents the grate-bars, which are constructed with a center or axis, *a*, from which four wings or lugs, *b*, radiate. These wings or lugs may or may not spring directly from the center of the axis, but it is deemed preferable that they should spring from a point to one side of it, as shown in Fig. 2; the object of this construction being to keep the bearings in a line, and to permit the wings or lugs on two adjoining bars to lap over each other, so as to form, in effect, a continuous table for the reception of the fuel, while at the same time ample openings are left for the passage of air. To the outer ends of the bars A, and upon the axis *a*, are secured cog-wheels B, which gear into each other, as shown, one wheel being provided at the front with a hand-lever, C, carrying a pawl, D, which engages with the cogs of the wheels B, for operating or rotating the bars A. Other means, however, can be employed for moving the bars, such as eccentric levers, or sprocket-wheels and chains, so that by moving one bar all may be moved in turn; or they may be arranged to act independent of each other, and moved one at a time by a suitable bar or wrench. By changing the meshing of the wheels the openings between the bars may be increased or decreased at will, to suit different grades of fuel. If a rotary motion be imparted to the bars A by means of the lever C and pawl D, the upper surfaces of the same is turned downward, and the ashes and clinkers emptied into the ash-pit. The wings or lugs *b*, at the same time, in turning, raise or stir the fuel up, and allow the free passage of air through the same.

In the case of bituminous or other waxy coals, sawdust, tan-bark, &c., this is a decided and important advantage. The rotary motion of the bars also breaks up and discharges all clinkers and dross from the fire by crushing them between the wings or lugs. By continuing the rotary motion of the bars the grate becomes, in effect, a dumping-grate, and the whole contents of the furnace can be discharged. This feature expressly adapts it for locomotive use. The lugs or wings *b*, being subjected to the action of the fire in succession, maintain their condition for a longer period of time, by which a great degree of economy is secured. The bars being set so that the wings or lugs overlap, they form a continuous fuel-table, so that finely-divided coal, sawdust, tan-bark, or coal-dust, even, can be burned, as it is simply impossible for it to pass through the openings between the bars, owing to their peculiar construction and arrangement. It may be observed that by coring out or casting the bars hollow, it then can be converted into a water-grate; also, the lugs or wings may be perforated with holes, if desired, to insure a perfect draft.

Having thus described my invention, what I claim as new and useful is—

1. The grate-bars A, constructed as described, and provided with the cog-wheels B, pawl D, and lever C, the several parts being arranged to operate substantially as and for the purpose described.

2. The bars A A, having four lugs or wings, *b*, so arranged that the wings of one bar lap over or project past the wings of the next succeeding bar, so as to form a continuous table for the reception of fuel, substantially as specified.

3. The grate-bars A, provided with the wings *b*, springing from a point to one side of the axis *a*, and at right angles to each other, substantially as and for the purpose described.

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Witnesses:

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