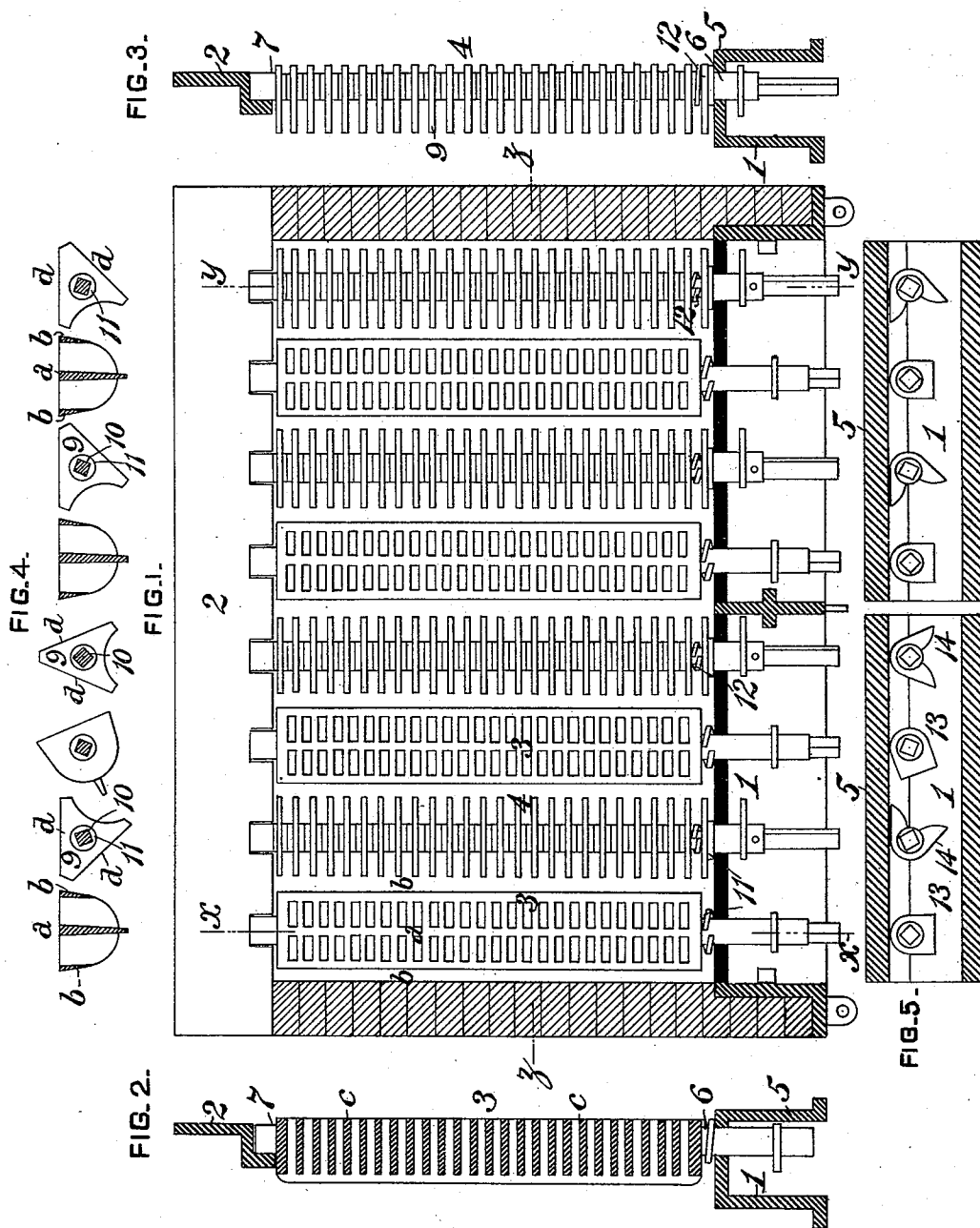


(No Model.)

W. & J. C. SWINDELL.
GRATE.

No. 469,070.

Patented Feb. 16, 1892.



WITNESSES:

Danville Wolcott
F. C. Gauthier.

INVENTORS:

William Swindell
John C. Swindell
by George H. Christy
Att'y.

UNITED STATES PATENT OFFICE.

WILLIAM SWINDELL AND JOHN C. SWINDELL, OF ALLEGHENY,
PENNSYLVANIA.

GRATE.

SPECIFICATION forming part of Letters Patent No. 469,070, dated February 16, 1892.

Application filed September 10, 1891. Serial No. 405,297. (No model.)

To all whom it may concern:

Be it known that we, WILLIAM SWINDELL and JOHN C. SWINDELL, citizens of the United States, residing at Allegheny, in the county of Allegheny and State of Pennsylvania, have invented or discovered certain new and useful Improvements in Grates, of which improvements the following is a specification.

The invention described herein relates to certain improvements in grates for furnaces, and has for its object a construction and arrangement of bars whereby the clinker and ashes may be easily removed without disturbing the superincumbent fuel; and in general terms the invention consists in the construction and combination, substantially as hereinafter described and claimed.

In the accompanying drawings, forming a part of this specification, Figure 1 is a plan view of a grate formed of my improved bars. Figs. 2 and 3 are sectional elevations, the planes of section being indicated by the lines xx and yy , respectively, of Fig. 1. Fig. 4 is a sectional view on the line zz , Fig. 1, the grate-bars being shown in different operative positions; and Fig. 5 is an end elevation showing the stops in the positions corresponding to those of the grate-bars in Fig. 4.

In the practice of our invention plates 1 and 2, provided along their inner edges with suitable bearings for the journals of the grate-bars, are supported on the front and rear walls of the furnace, and the journals 6 and 7 of the grate-bars 3 and 4 are placed in position in the bearings in the plates 1 and 2. A cap-plate 5 is then placed over the front plate 1, said plate extending out over the front journals 6 of the grate-bars, thereby protecting said journals and providing a stop-plate for limiting the oscillation of the grate-bars, as hereinafter described.

Each grate-bar 3 consists of a reticulated body portion preferably formed by a central web or plate a , two side webs or plates b , parallel with the central web, and a series of transverse webs c , integral with the longitudinal webs and forming in connection therewith a series of open-ended pockets for the passage of air and ashes to and from the superincumbent bed of fuel.

Each grate-bar 4 consists of a series of tri-

angularly-shaped disks 9, having two straight sides d , while the other side is preferably concave, as shown. The disks are secured to the shaft 10, so as to rotate therewith, preferably by forming an angular opening through the center of the disks and making the shaft of corresponding shape in cross-section, as shown in Fig. 4. In order to properly space the disks on their shafts, it is preferred to form bosses or hubs 11 on the sides thereof, as shown in Figs. 1 and 2, or an independent collar may be placed between the disks. In order to hold the disks together on the shaft and at the same time permit of their lateral expansion when heated, a spring-washer 12 is placed between two of the disks or between the end disk and the supporting-plate 1, as shown in Fig. 1.

The grate-bars 3 and 4, constructed as described, are arranged alternately in the furnace, as shown in Figs. 1 and 4, and on the journals 6 and 7, outside of the supporting-plate 1, are fixed the indicating and limiting plates 13 and 14, which serve not only to indicate the positions of the bars 3 and 4, but also to prevent by contact with the cap-plate 5 a too large movement or oscillation of the bars. When in normal position, the bars 3 have their flat faces uppermost and the bars 4 have one of the edges d of the disks uppermost, as shown in Figs. 1 and 4. The plates 13 are so constructed and attached to the journals of the bars 3 that the latter may be oscillated in either direction through an arc of ninety degrees (more or less) from their normal position, thereby shifting the supporting-faces of the bars into a vertical plane, or approximately so. After the bar or bars 3 have been so turned the bars 4 are similarly oscillated, thereby causing one of the apices of the disks 9 to traverse the face of the adjacent bar 3, so as to remove any adherent cinder or clinker, while another of the apices will pass through the under portion of the fire, thereby freeing it from ashes. In shifting the bars 4 one of the supporting-edges d is turned down while the other edge is brought into operative position, and hence while it is necessary to return the bars 3 to normal position—i. e., with their faces uppermost—the bars 4 need not be shifted until it again becomes necessary to clean the fire. The oscillation of the bars may

be effected by a suitable wrench fitting the outer angular ends of the journals 6 or by any other suitable means. By removing the cap-plate 5 any one or all of the grate-bars may
5 be removed and new ones inserted, the superincumbent fuel being temporarily supported by rods forced in above the grate in the manner well known in the art.

We claim herein as our invention—

- 10 1. In a grate for furnaces, the combination of a series of oscillating bars having an open or reticulated body portion and a series of oscillating bars alternating with the other bars and consisting of a series of triangularly-
15 shaped disks, substantially as set forth.

2. In a grate for furnaces, the combination of a series of oscillating bars having an open or reticulated body portion, a series of oscillating bars alternating therewith and consisting of a series of triangularly-shaped disks, 20 and indicating-plates on the journals of the bars, substantially as set forth.

In testimony whereof we have hereunto set our hands.

WILLIAM SWINDELL.
JOHN C. SWINDELL.

Witnesses:

DARWIN S. WOLCOTT,
R. H. WHITTLESEY.