

J. W. REYNOLDS.

Grate.

No. 214,703.

Patented April 22, 1879.

Fig. 1.

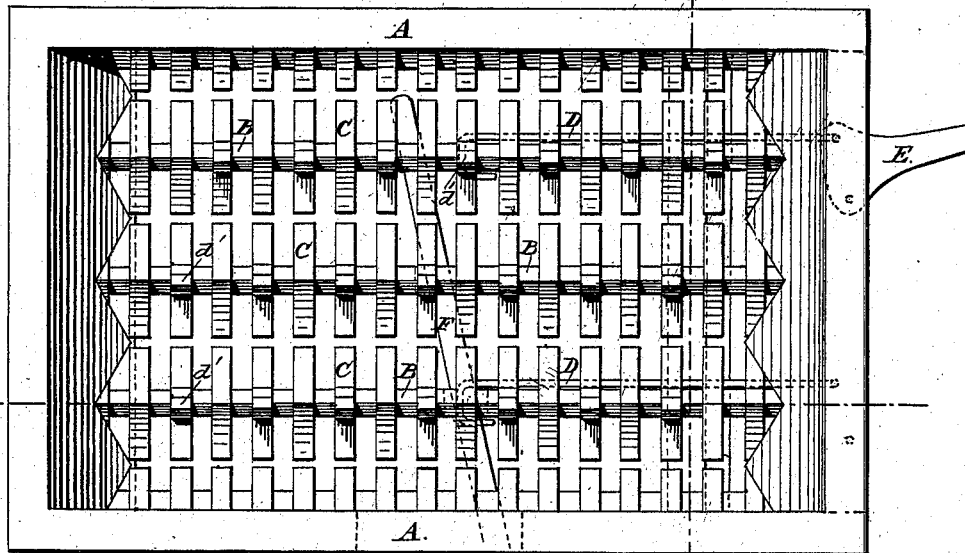


Fig. 2.

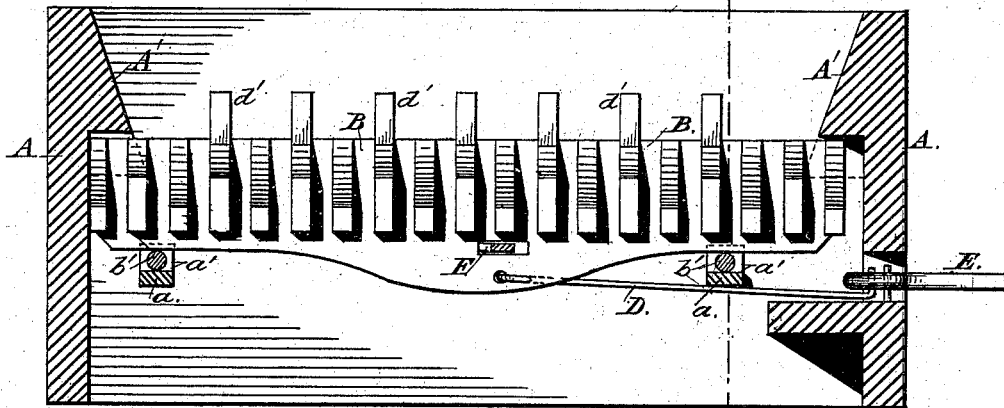
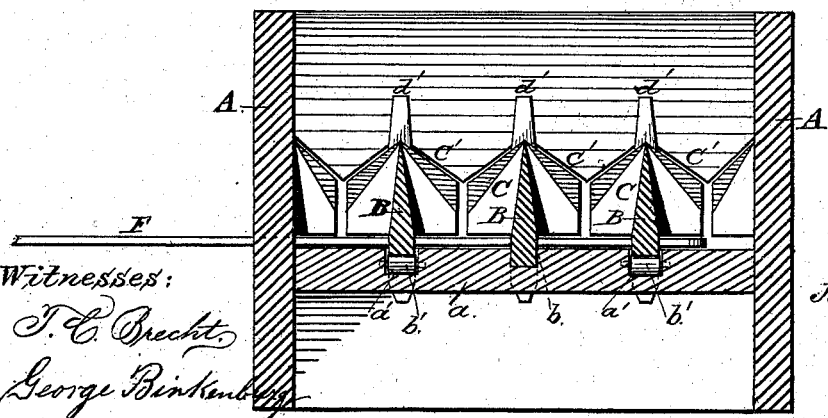


Fig. 3.



Witnesses:

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UNITED STATES PATENT OFFICE

JOHN W. REYNOLDS, OF ESPY, PENNSYLVANIA.

IMPROVEMENT IN GRATES.

Specification forming part of Letters Patent No. **214,703**, dated April 22, 1879; application filed September 20, 1878.

To all whom it may concern:

Be it known that I, JOHN W. REYNOLDS, of Espy, in the county of Columbia and State of Pennsylvania, have invented certain new and useful Improvements in Grates; and I do hereby declare that the following is a full, clear, and exact description of the invention, which 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 the letters of reference marked thereon, which form a part of this specification.

My invention relates to grates for furnaces, steam-boilers, stoves, fire-places, &c., having for its special object simplicity of construction, durability, and an easy, simple method of clearing the grate of ashes and cinders.

Figure 1 is a plan view of a grate embodying my invention. Fig. 2 is a longitudinal section of the same. Fig. 3 is a transverse sectional view of the grate.

A A is the inclosure or walls of the grate, built of stone, brick, or iron, as circumstances require, in any required form, usually rectangular, or approaching that, forming the base or foundation of the furnace, boiler, or whatever the structure may be. Each end of the inclosure is crossed by iron bearing-bars *a a*, on which the grate-bars B B rest, or into which they are framed, the bearing-bars themselves being framed into and forming part of the frame-work of the walls. The inside of the walls, over the ends of the grate-bars, as shown at A' A', slopes inward and downward, to prevent the fuel from dropping down behind the ends of the bars and obstructing their movement.

Shallow notches *a' a'*, at convenient distances, are sunk into the bearing-bars *a a*, through which the grate-bars slide; and in case the grate-bars are required to be very large and sustain great weight of fuel, short solid iron friction-rollers *b' b'* may be inserted into the notches *a' a'*. (Seen in Figs. 2 and 3.)

B B are parallel cast-iron grate-bars, wedge-shaped, and sufficiently broad on their bottom edge and deep to give any required strength. Their lower or bottom edge decreases in depth each way from the center, forming an additional means of strength. These bars sustain

the lugs or projections C C', which are immovably attached or cast to them. The stationary bars are shouldered, as shown at *b b*, to prevent being displaced. Each alternate bar moves freely back and forth longitudinally on the bearing-bars *a a*, being let into them by the shallow notches *a' a'*.

Either wall of the inclosure on the sides parallel to the grate-bars is conformed to them—that is, either side of the inclosure is set with lugs, and performs the office of a stationary grate-bar.

The upper extremity of each alternate lug in the series marked C C', coincident with and starting from the upper edge of the grate-bars, slopes to its lower end at a sharper angle than the adjoining one; but the angles of the alternate lugs are equal. The upper extremity of the alternate lugs in the series marked C' terminates in a square cap, *d'*, equal in length to one-fourth or one-third the length of the lugs, and are designed to break up the fuel or cinders that may become baked or fixed above the grate-bars. These lugs are cast hollow, thus somewhat relieving their weight, and as far as possible facilitating cooling by the circulation of air through them. With the exception of their upper faces, the sides of the lugs join at right angles.

D D are wrought-iron shaking-rods, bent upward at their front or outer ends, where they rest on the front walls, the other ends being firmly attached to the centers of the movable grate-bars B B. By means of these rods the movable grate-bars are moved back and forth, when, by reason of the alternating size of the lugs, the cinders are broken up, and with the ashes and dirt are shaken out of the grate.

E is a lever, located at the front end of the furnace, for moving the grate-bars B B.

When the grate is used in fire-places and small furnaces, where its width is generally greater than its length, as would be the case should the grate, as shown in Fig. 1, be reversed, the length and sides change places. In such case a lever, F, would be attached to the grate, as shown, through a slot in the side of the inclosure A.

It is understood that the side walls of the grate are stationary grate-bars, provided with the lugs or projections C C'. Considering the

side walls, provided as above, as stationary grate-bars, and counting from them, each alternate bar moves freely back and forth longitudinally on the friction-rollers *a' a'*, and by this means grinding up the cinders and shaking out the dirt, débris, and ashes, thus accomplishing the purpose of my invention—keeping the grate clean and free.

What I claim is—

1. A grate-bar, B B, having side projections or lugs, C C', saddling said bar, the upper faces of said lugs alternating, being of different angles, and provided with upper hollow projections, *d' d'*, arranged as shown and described.

2. The combination of the grate-bars B B,

constructed as described, with the friction-rollers *b' b'* and notches *a' a'* in the bearing-bars *a a*, as shown and specified.

3. In combination with the grate-bars B B, having a central web, provided with lugs or projections C C', as described, the friction-rollers *b' b'* and shaking-rods D D, forming a complete grate, substantially as and for the purpose specified and set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

JOHN W. REYNOLDS.

Witnesses:

WILLIAM ABBOTT,
J. H. MAIZE.