G. B. MERSHON.

Grate.

No. 213,228. **Patented Mar. 11, 1879.**

Fig. 1.

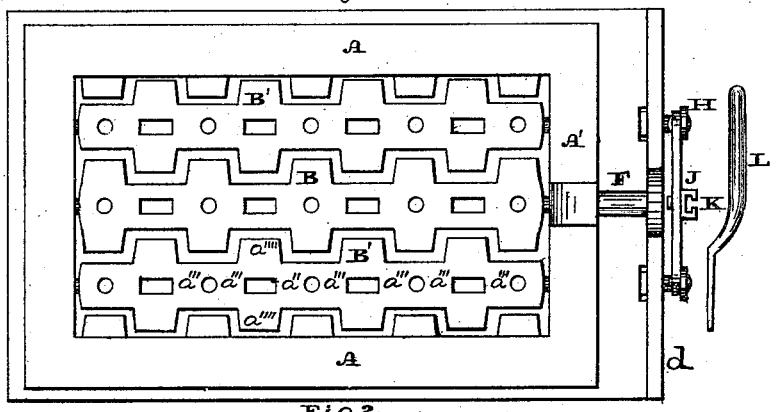


Fig. 2.

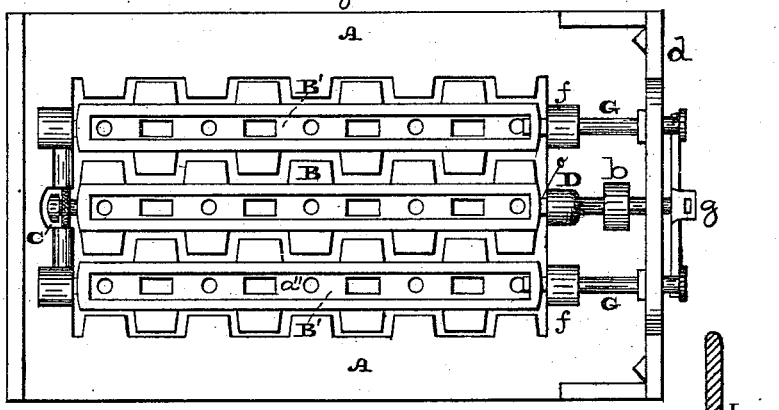


Fig. 3.

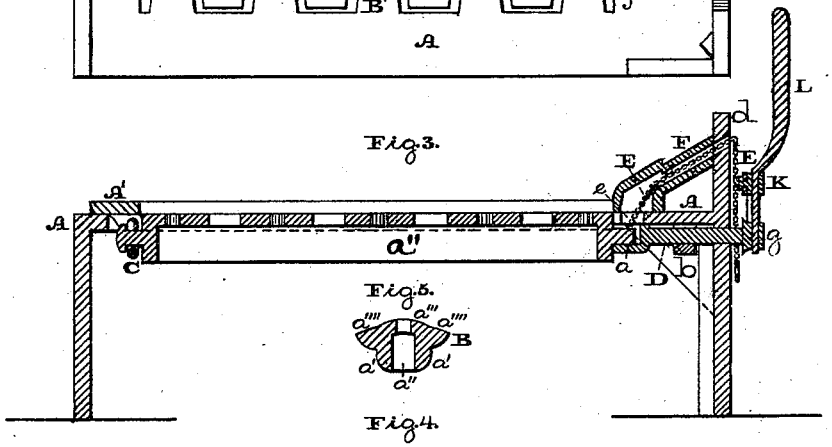
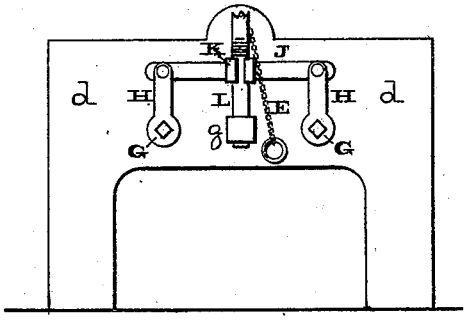


Fig. 5.

Fig. 4.



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UNITED STATES PATENT OFFICE.

GEORGE B. MERSHON, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO ALBERT H. MERSHON, OF SAME PLACE.

IMPROVEMENT IN GRATES.

Specification forming part of Letters Patent No. **213,228**, dated March 11, 1879; application filed November 6, 1878.

To all whom it may concern:

Be it known that I, GEORGE B. MERSHON, of the city and county of Philadelphia, and State of Pennsylvania, have invented a new and useful Improvement in Grates, which improvement is fully set forth in the following specification and accompanying drawings, in which—

Figure 1 is a top or plan view of the grate embodying my invention. Fig. 2 is a bottom view thereof. Fig. 3 is a central vertical section thereof. Fig. 4 is a front view thereof. Fig. 5 is a transverse section of one of the bars.

Similar letters of reference indicate corresponding parts in the several figures.

My invention consists of a rotary grate-bar formed of two solid side walls or webs separated by a slot or channel running lengthwise and connected by bridges, whereby the bar is light, strong, and durable, and air is freely admitted through the same without depriving the fire of its proper support, the slot permitting the application of a poker throughout its length to clear the bar when clogged. The several bars have studs projecting laterally from the upper ends of the webs, and alternating in adjacent bars for presenting a broad surface for properly supporting the fire, and likewise increasing the raking action.

It also consists of a dropping-bar provided with a chain or connection leading through the front plate above the grate for conveniently restoring said bar to its operative position from the front of the furnace, said connection having a covering, whereby it is prevented from being clogged by ashes, &c.

It also consists of the combination, with the rocking grate-bars, of rotary shafts detachably connected thereto and fixed to the bed-plate, as hereinafter set forth.

It also consists in providing the raking or shaking mechanism with a swiveled eye, whereby the lever thereof may be operated with greatest freedom.

Referring to the drawings, A represents the bed-plate, on which are supported the grate-bars B B′, the central one, B, of which is mounted at its rear end on a swinging hanger, C, supported on the bed-plate, and formed at its front end with an angular projection, *a*, adapted to enter a bearing, D, which has horizontal sliding motions on a hanger, *b*, on the under side of the bed-plate, and on the front rest-plate, *d*, whereby said bearing may be either engaged with or disengaged from said central bar, B, for the purpose of either holding or lowering the same.

To the projection *a* there is secured a chain, E, which is passed through an opening, *e*, in the bed-plate, and through a guide or tubular covering, F, which, rising angularly from a face-plate, A′, communicates with an opening in the front rest-plate, *d*, the chain extending through said opening, so as to be conveniently accessible in front of the furnace.

The bars B′ are supported at the rear on the bed-plate or hanger thereon, and formed in front with angular openings, through which are passed shafts G, which are journaled in the front rest-plate, *d*, and hangers *f* on the under side of the bed-plate.

To the front ends of the shafts G there are connected arms H, to whose upper ends is pivoted a horizontal bar, J, occupying a position in front of the rest-plate *d*, and at the central portion of said bar is a swiveled eye, K, which coincides with an eye, *g*, on the front portion of the sliding bearing D, a lever, L, being adapted to enter said eyes K *g*, as most clearly shown in Figs. 3 and 4.

The operation is as follows: By operating the lever L rocking motions are simultaneously imparted to the bars B B′ to the desired extent for properly raking the fire.

When the fire or ashes are to be let down the lever L is removed and the bearing D drawn out. The central bar losing its support at the front end falls, turning on the hanger C as an axis, and leaves a space through which the fire or ashes may descend, the operation being assisted by rotating the other bars.

In order to restore the central bar the chain E is raised, thus elevating the bar to a line with the bearing D, and the bearing D forced in, so that the front end of the bar and the bearing engage, whereby the bar is again properly supported.

It will be seen that the chain E is operative

from the front of the rest-plate, and passing through the tubular guide F is covered and prevented from being clogged, &c.

When the bars are worn out they may be removed and replaced by first displacing the face-plate A′, the central bar being detachable from the bearing D in front and supported loosely on the hanger C at the rear, as has been stated.

By raising the bars B′ B′ at the rear the front ends of the same are readily disengaged from the shafts G, whereby said bars may be easily removed from the bed-plate and afterward restored or replaced, as is evident, the shafts G G remaining, as it were, fixtures of the bed-plate, as they are not materially affected by the fire. The swiveled eye K readily rotates on the bar J and coincides with the motions of the eye *g*, whereby the lever L operates with ease and freedom and without the binding of any of the parts. Each bar is formed of two solid walls or webs, *a′*, between which is a slot or channel, *a″*, extending continuous throughout the length thereof, and united at top at intervals by bridges *a‴*, which leave openings communicating with said slot *a″*, or, in other words, the crown of the bar is perforated. Studs *a⁗* project from the upper end of the side walls, *a′*, whereby the bars present a broad surface for properly supporting the fire, and, owing to the long slots *a″*, sufficient air is admitted to the openings at top between the bridges, and the bars are in a measure kept cool. Moreover, the solid walls and top bridges present somewhat of an arch-shaped structure, which is strong and durable, and the bars are considerably lightened, while, however, preserving the solidity of the walls *a′*, the slot *a″* also permitting the bars to clear themselves of ashes, &c., from below; and when the ashes or cinders do not disengage themselves the entire length of the slot or channel is available for the insertion and powerful operation of a poker.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. The rotatable grate-bar consisting of the perforated crown *a‴*, two solid side webs, *a′*, the studs *a⁗*, projecting laterally from said webs and rotary end supports, substantially as and for the purpose set forth.

2. The dropping-bar B and chain or connection E, in combination with the covering-guide F, substantially as and for the purpose set forth.

3. The combination, with the rocking grate-bars B′, of the rotary shafts G, detachably connected thereto and fixed to the bed-plate, substantially as and for the purpose set forth.

4. The combination, with the rocking grate, of the bar J, provided with the swiveled eye K, coincident with the eye *g* of the bearing of the central grate-bar, substantially as and for the purpose set forth.

GEORGE B. MERSHON.

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