(No Model.)

W. PHIPPS.

GRATE FOR FURNACES, &c.

No. 385,957. Patented July 10, 1888.

Fig. 1.

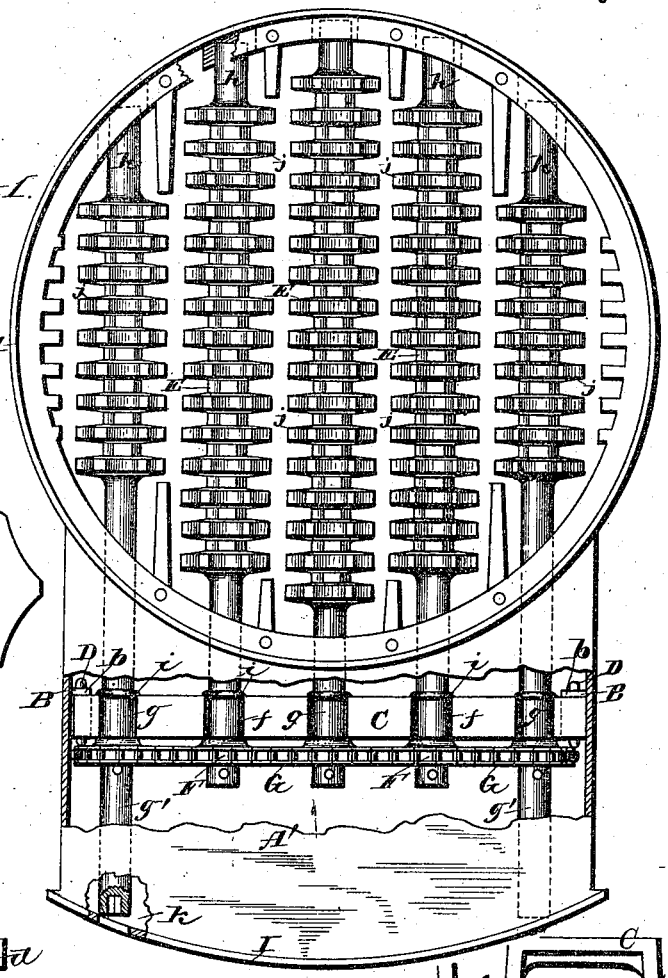


Fig. 6.

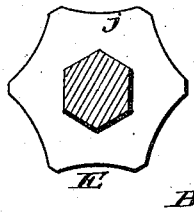


Fig. 3.

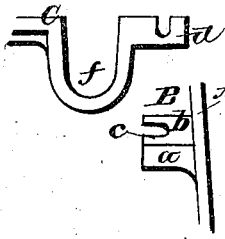


Fig. 2.

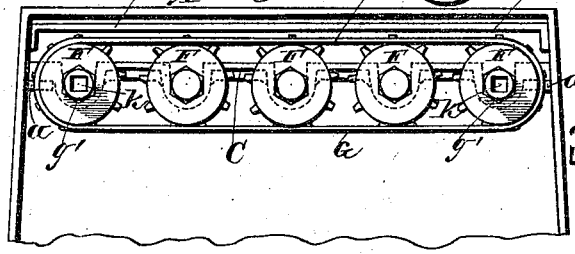


Fig. 4.

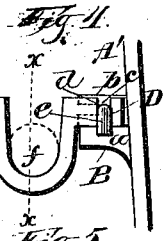
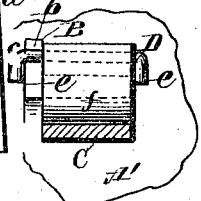


Fig. 5.



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UNITED STATES PATENT OFFICE.

WILLIAM PHIPPS, OF MILWAUKEE, WISCONSIN.

GRATE FOR FURNACES, &c.

SPECIFICATION forming part of Letters Patent No. 385,957, dated July 10, 1888.

Application filed December 27, 1886. Serial No. 222,636. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM PHIPPS, of Milwaukee, in the county of Milwaukee, and in the State of Wisconsin, have invented certain new and useful Improvements in Grates for Furnaces, Stoves, &c.; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to grates for furnaces, stoves, &c.; and it consists in certain peculiarities of construction and combination of parts, to be hereinafter described with reference to the accompanying drawings, and subsequently claimed.

In the drawings, Figure 1 represents a plan view of my grate in operative position; Fig. 2, a front elevation of the same; Fig. 3, a detail view of the transverse supporting-bar and one of the seats therefor detached; Fig. 4, a similar view of the supporting-bar and seat united; Fig. 5, a section taken on line *x x*, Fig. 4; and Fig. 6, a transverse section of my preferred form of grate-bar.

Referring by letter to the drawings, A represents the ash-box of a furnace having a front extension, A′, each side of the latter being interiorly provided with an angular bracket, B, that has a horizontal portion or seat, *a*, for the adjacent end of a transverse bar, C, and a vertical upwardly-extended portion, *b*, provided with a horizontal slot, *c*.

The transverse bar C has each end thereof provided with a vertical slot, *d*, that receives a pin, D, the latter having its respective ends *e* bent at right angles to come against the sides of the brackets B, as best illustrated by Figs. 4 and 5.

To set the transverse bar C in position, the pins D are turned in the vertical slots *d*, so that their right-angular ends *e* will be horizontal or in line with the bracket-slots. The bar C, being in place on the horizontal portions or seats *a* of the brackets B, is pushed rearward until the rear ends of the pins D pass through the adjacent slots *c* in the vertical upwardly-extended portions *b* of said brackets. The pins D are now turned so that their right-angle ends *e* assume the position shown in Figs. 4 and 5, and the bar C is firmly locked in place.

To remove the bar C it is only necessary to turn the pins D so that their ends *e* will register with the horizontal slots in the brackets B, and then draw said bar to the front.

The transverse bar C is provided with a series of bearings, *f*, for the front journals, *g*, of parallel grate-bars E, the rear journals, *h*, of these grate-bars having their bearings in the adjacent wall of the ash-box, as illustrated by full and dotted lines, Fig. 1.

To prevent the grate-bars E from getting out of place, I provide their front journals, *g*, with collars *i*, that come against the inner side of the transverse supporting-bar C, as shown by Fig. 1.

My grate-bars are preferably made with a series of polygonal collars, *j*, arranged at suitable intervals and cast in one piece with the solid central part of said bars, the polygonal faces of these collars being also preferably concave, as best illustrated by Fig. 6.

To the journals of the grate-bars E, in front of the transverse supporting-bar C, are keyed sprocket-wheels F, on which is operatively arranged a drive-chain, G, a transverse guard-piece, H, being secured to the ash-box extension A′, as shown by Fig. 2, to prevent said chain from slipping off the sprocket-wheels.

The extreme outer grate-bars E have their front journals, *g*, provided with extensions *g′*, that are designed to register with suitable openings in the door I of the ash-box, and each of these journal-extensions has a socket, *k*, to receive a suitable crank (not shown) by which to operate the entire grate. If found more desirable, the journal-extensions *g′* may be simply squared for the purpose of receiving a suitable crank. The front journal only of the center grate-bar may be extended and provided with a crank-socket; but for large grates the construction described in the preceding paragraph is deemed preferable, not only on account of its convenience, but for the reason that the drive-chain G is kept taut throughout its length while the grate is being operated, and hence there is no liability of said chain buckling.

If desired, but one of the extreme outer grate-bars may have its journal extended and provided with a crank-socket; but I have shown both the outer bars thus constructed, and prefer such construction for the sake of the convenience it affords the operator.

It is not absolutely necessary that each of the grate-bars be provided with a sprocket-wheel, and, if found desirable, I may at times omit some of these wheels—say every alternate one thereof—thereby having some of said bars stationary and the others capable of being revolved.

Instead of omitting some of the sprocket-wheels I may arrange them loose on their journals as supports for the drive chain; but it will be understood that any or all of the grate-bars constructed to be engaged by a crank have their sprocket-wheels fast thereon.

By the construction above described it will be noticed that the loose grate-bars are all revolved in the same direction and that one side of each bar carries down the ashes while the other side forces the coal back, thereby effecting a saving in fuel. The grate-bars may be revolved in either direction or alternately back and forth, as the operator may prefer; and a peculiar advantage obtained by my grate is that the draft is not impeded and the agitation may be regulated to dump a greater or less quantity of ashes.

It will be noticed that the effect of the bars in my invention is the same at all times, no matter what position they may be in, and each two adjacent bars are always in the same relative position.

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

1. A grate comprising a series of parallel bars and a front supporting-bar therefor, the latter having its ends provided with vertical slots, in combination with angular seats for said ends of the transverse bar having vertical upwardly-extended portions provided with horizontal slots, and pins having right-angular ends and arranged to engage the slots of said transverse bar and seats, substantially as and for the purpose set forth.

2. The combination, with a furnace ash-box having its sides interiorly provided with angular brackets, of a transverse bar having its ends detachably secured to the brackets, a series of parallel grate-bars journaled in a wall of the ash-box, and the transverse bar, sprocket-wheels fast on the front journals of the grate-bars, a drive-chain arranged on the sprocket-wheels, and one, two, or more of said grate-bars extended outward and shaped to engage a crank, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

WILLIAM PHIPPS.

Witnesses:
GEORGE T. PHIPPS,
N. E. OLIPHANT.