

(No Model.)

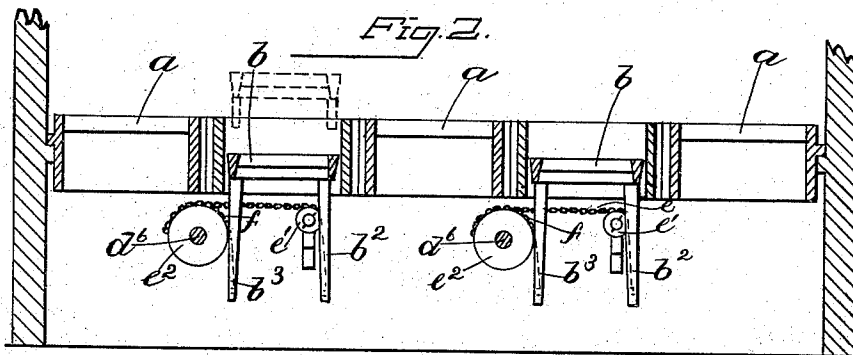
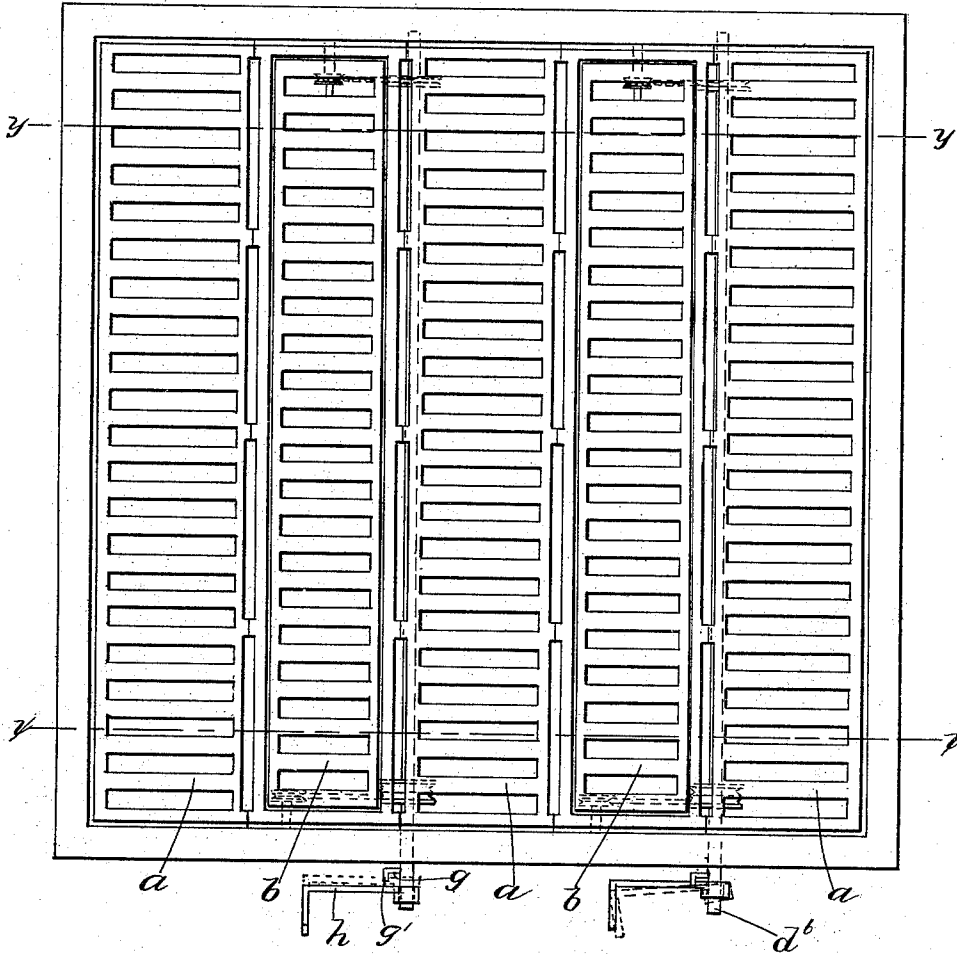
2 Sheets—Sheet 1.

E. FALES.
GRATE.

No. 505,450.

Patented Sept. 26, 1893.

Fig. 1.



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(No Model.)

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GRATE

2 Sheets—Sheet 2.

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Fig. 3.

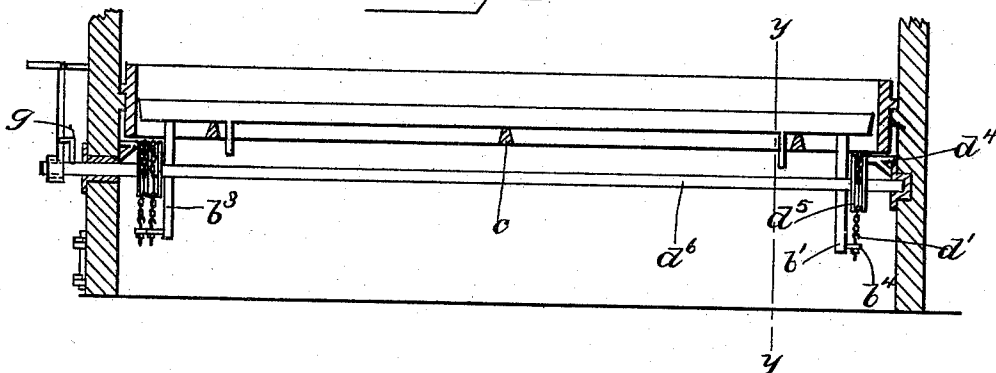


Fig. 4.

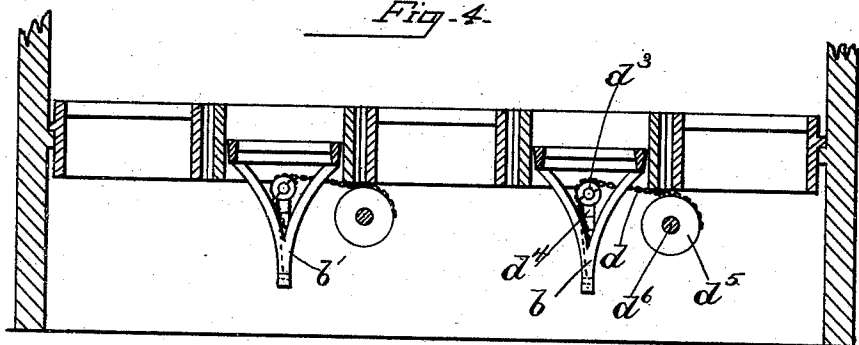


Fig. 5.

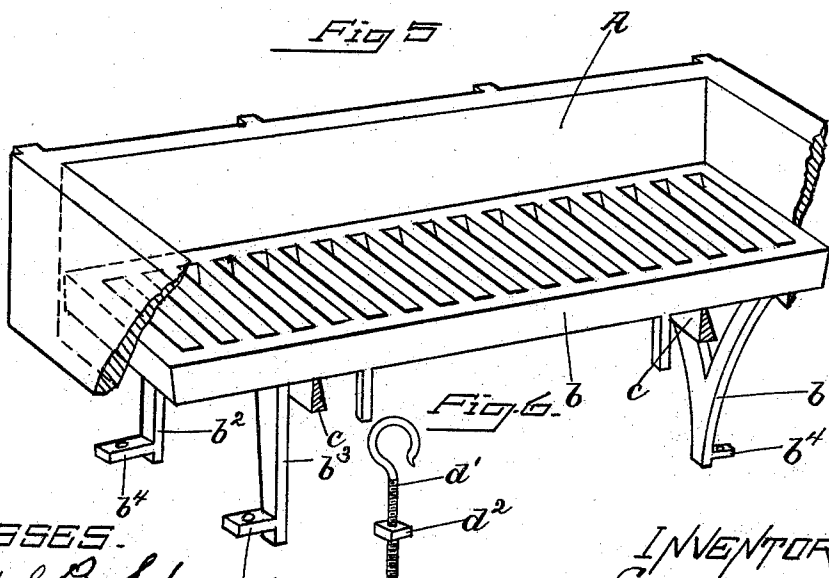
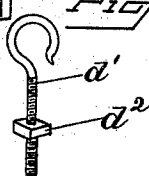


Fig. 6.



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UNITED STATES PATENT OFFICE.

EDWARD FALES, OF BOSTON, MASSACHUSETTS.

GRATE.

SPECIFICATION forming part of Letters Patent No. 505,450, dated September 26, 1893.

Application filed February 28, 1893. Serial No. 464,016. (No model.)

To all whom it may concern:

Be it known that I, EDWARD FALES, of Boston, county of Suffolk, State of Massachusetts, have invented an Improvement in Grates, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve the construction of shaking and dumping mechanism for grates, whereby one or more of the grated sections may be bodily raised and lowered vertically, yet continually maintaining its horizontal position, in contradistinction to being rocked or tilted as is now common.

In carrying out this invention to produce efficient results I find that the grate may be raised bodily manually, carrying up with it the coal which rests upon it, and then released or permitted to fall by gravity or otherwise caused to quickly descend to its normal position, in advance of the coal which thereafter follows down, and thereby becomes thoroughly disturbed.

One way of carrying out my invention is herein shown which consists in providing the grate with depending legs, to the lower ends of which suitable chains are connected which pass over or around or partially around pulleys secured to a shaft, the parts being so constructed and arranged that by a partial rotation of said shaft the grate will be bodily raised.

Means are provided by which the elevated grate may be permitted or caused to descend rapidly as for instance by disengaging the operating device or crank from the shaft.

My invention is particularly adapted to grates having pockets or depressed portions with grated bottoms, because in such event the shaking mechanism will be connected with the grated bottoms or portions of the said pockets which may be raised into a plane with the remaining portions of the grate, and there held if desired while the bed of coal is being withdrawn, or the fire banked, or while new coal is being supplied, and in the latter event when said grated bottoms or portions are restored to their normal positions, the new

coal will follow and become covered by the live coals which tumble in at the sides.

Figure 1, shows in plan view a grate provided with shaking and dumping mechanism embodying this invention; Fig. 2, a vertical section of the grate shown in Fig. 1, taken on the dotted line $x-x$, looking toward the front; Fig. 3, a longitudinal section of the grate shown in Fig. 1, to more clearly show the operating device, and its shaft; Fig. 4, a vertical section of the grate shown in Fig. 1, taken on the dotted line $y-y$, looking toward the rear; Fig. 5, a perspective detail to be referred to, and Fig. 6, a detail to be referred to.

The grate shown in Fig. 1, comprises three stationary boxes a, a, a , having grated tops, and two intermediate pockets having grated bottoms b, b , yet my invention may be applied to other forms of grates. The grated bottoms b, b , are each herein shown as movable bodily up and down by similarly constructed mechanism, so but one only will be described. The grate b has at its rear end a single downwardly extended leg b^1 , and at its forward end two downwardly extended legs b^2, b^3 , each leg having a lug as b^4 , with a hole through it. Cross bars c are secured to the under side of the box A , which contains said grate b , upon which said grate rests when in its normal position as represented in Fig. 5. Although said cross bars are herein represented as secured directly to the bottom of the box, they may be suspended lower down if desired, and the grate otherwise supported in its normal position, but I prefer to employ the cross bars as herein shown. A chain d is connected at one end to a screw eye d^1 , which passes through a hole in the lug b^4 , and is held in adjusted position by a nut d^2 , said chain passing over a small pulley d^3 , supported upon or by a bracket d^4 or otherwise, and thence passing over upon or around or partially around the circumferentially grooved pulley d^5 , secured to a shaft d^6 suitably supported. A similar chain e is secured at one end to the lower end of the leg b^2 , in a similar manner, passing over the pulley e^1 , and thence over or around or partially around the pulley e^2 , secured to the forward end of said shaft d^6 . A similar chain f is connected in a

like manner at one end to the lower end of the leg b^3 , and thence passes over or around or partially around the pulley e^2 . This pulley e^2 , has two circumferential grooves to receive the chains e and f . By employing two chains at one end and a single chain at the other end the grate may be raised and continually retain its horizontal position, yet said chains may be connected at any other desirable point. The shaft d^6 extends from end to end of the grate and at the forward end it projects through the masonry, or front wall, and has secured to it a short arm g , provided with a projection g' , which extends forward, and the operating device or crank h is provided with a hole somewhat larger than the shaft d^6 to receive said shaft loosely. The operating device having been applied to the shaft d^6 , its shank is brought into engagement with the projection g' , on the short arm g , and then by turning said operating device a partial revolution, the shaft d^6 is correspondingly turned, the chains wound upon the several pulleys and the grate bodily raised to the desired height, as for instance flush with the tops of the adjacent stationary grates. Then by tilting the said operating device forward as represented by dotted lines Fig. 1, it is disengaged from said arm, whereupon the grate falls by gravity, quickly resuming its normal position. Thus it will be seen that the grate is raised bodily manually, but restored to its normal position by gravity. The descent of the grate is so rapid, and its movement so suddenly checked that the coal fails to follow with it, but thereafter follows down, and being also jarred by the sudden stopping of said grate the bed of coal is thoroughly disturbed, and the ashes eliminated. The operation may be repeated several times if necessary.

The grate may be held in its elevated position if desired by a pin inserted in the masonry upon which the operating device will rest, and when in such position the bed of coal may be withdrawn or dumped in any usual way, or raked, or the fire banked, or new coal supplied.

When new coal is supplied with the grate in its elevated position, it will be seen that as the grate descends the new coal follows, and the live coal tumbles in at the sides, thereby covering the new coal with the live or incandescent coal, which burns all the gases and other products of the fuel, producing more heat. The grate may be raised to a height above the point flush with the tops of the adjacent portions to thereby present openings at the side through which the coal may be dumped.

Many ways may be devised for bodily raising the grate, and thereafter releasing it, permitting it to fall by gravity or otherwise, so I do not desire to limit my invention to the particular way herein shown. If the chains are used as herein shown they may be ad-

justed at will, and the ends which are connected with the pulleys will be attached by set screws.

I claim—

1. In a grate, the stationary boxes a , having grated tops, and the alternately arranged boxes having movable grated bottoms b , a rod or shaft supported beside each grated bottom b , means for rotating each rod or shaft, and intermediate connections between said rods or shafts and said grated bottoms whereby said grated bottoms may be moved up and down bodily, substantially as described.

2. The grate b having downwardly extended legs, the shaft d^6 , beside it, and chains connecting the lower ends of said legs with said shaft, and an operating device for said shaft, substantially as described.

3. The grate b having at one end a single downwardly extended leg, and at the other end two downwardly extended legs, the shaft d^6 beside said grate, and pulleys thereon, and chains connecting the lower ends of said legs with said pulleys, and an operating device for said shaft, substantially as described.

4. The grate b having downwardly extended legs with lugs b^4 , thereon having holes through them, the shaft d^6 , and pulleys thereon, and chains connected to said pulleys at one end, and to screw eyes at the other end, which pass through the holes in said lugs, substantially as described.

5. The grate b , shaft d^6 beside it, and chains connecting said grate with said shaft, a short arm g on said shaft having a projection g' , and a detachable operating device h fitting loosely upon said shaft and adapted to engage said short arm g , to turn the shaft and thereby bodily raise the grate, and to be disengaged from said short arm to thereby permit said grate to fall by gravity in advance of the coal resting upon it, substantially as described.

6. In a grate, the combination of the box like frame A and bodily movable grate b therein, the rod or shaft located beside it, and intermediate connections between said grate and said rod or shaft, a fixed part $g-g'$ on said shaft, the manual operating device h adapted to engage and rock on said shaft, engaging the fixed part $g-g'$ to turn the shaft in one direction and releasing said fixed part, by rocking on the shaft, to permit said shaft to be turned in the opposite direction by the weight of the grate, and the stationary box a having grated tops flush with the top of said box like frame A , substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

EDWARD FALES.

Witnesses:

BERNICE J. NOYES,
FRED. S. PINKHAM.