(No Model.)

W. B. DUNNING.

GRATE.

No. 370,458. Patented Sept. 27, 1887.

Fig. 1.

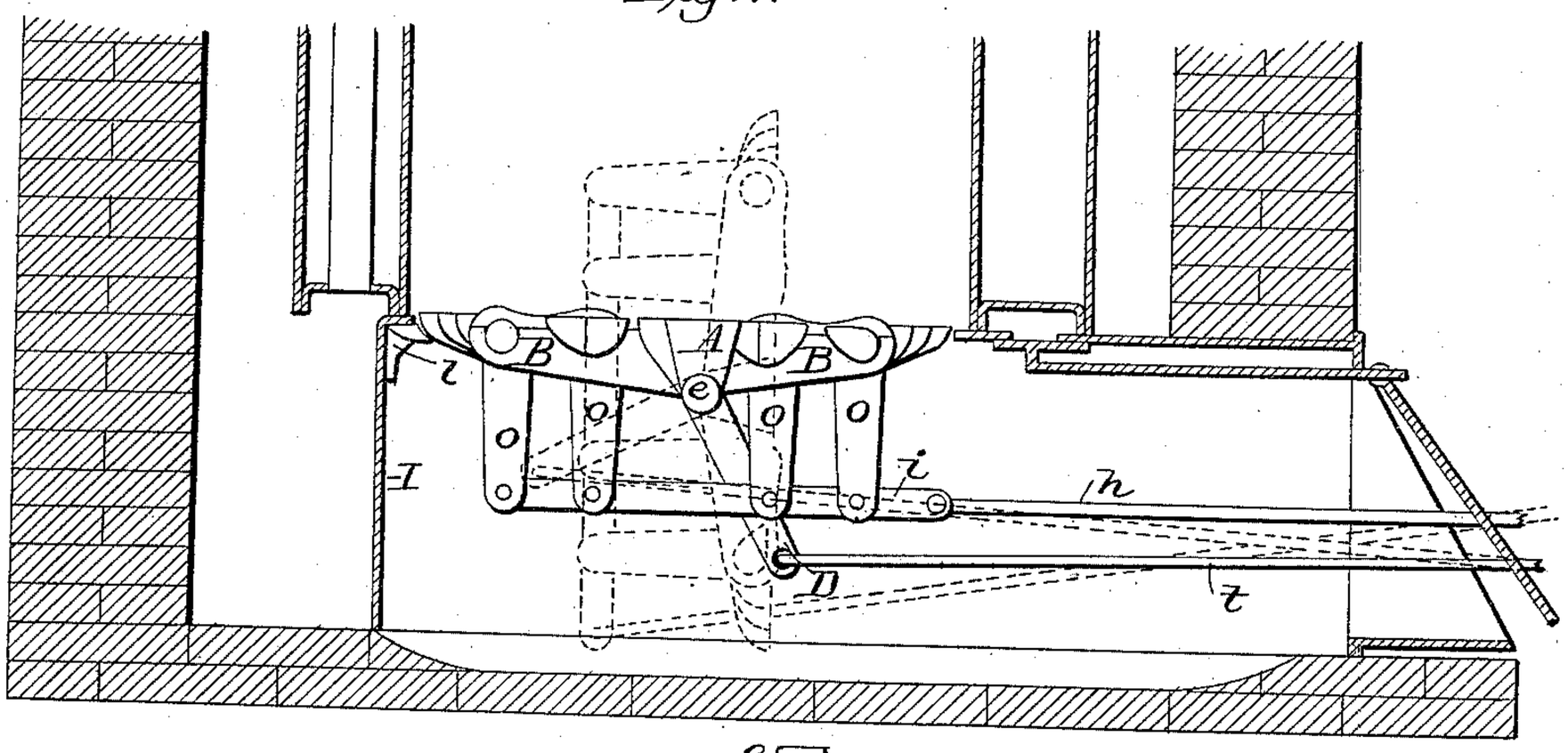


Fig. 2.

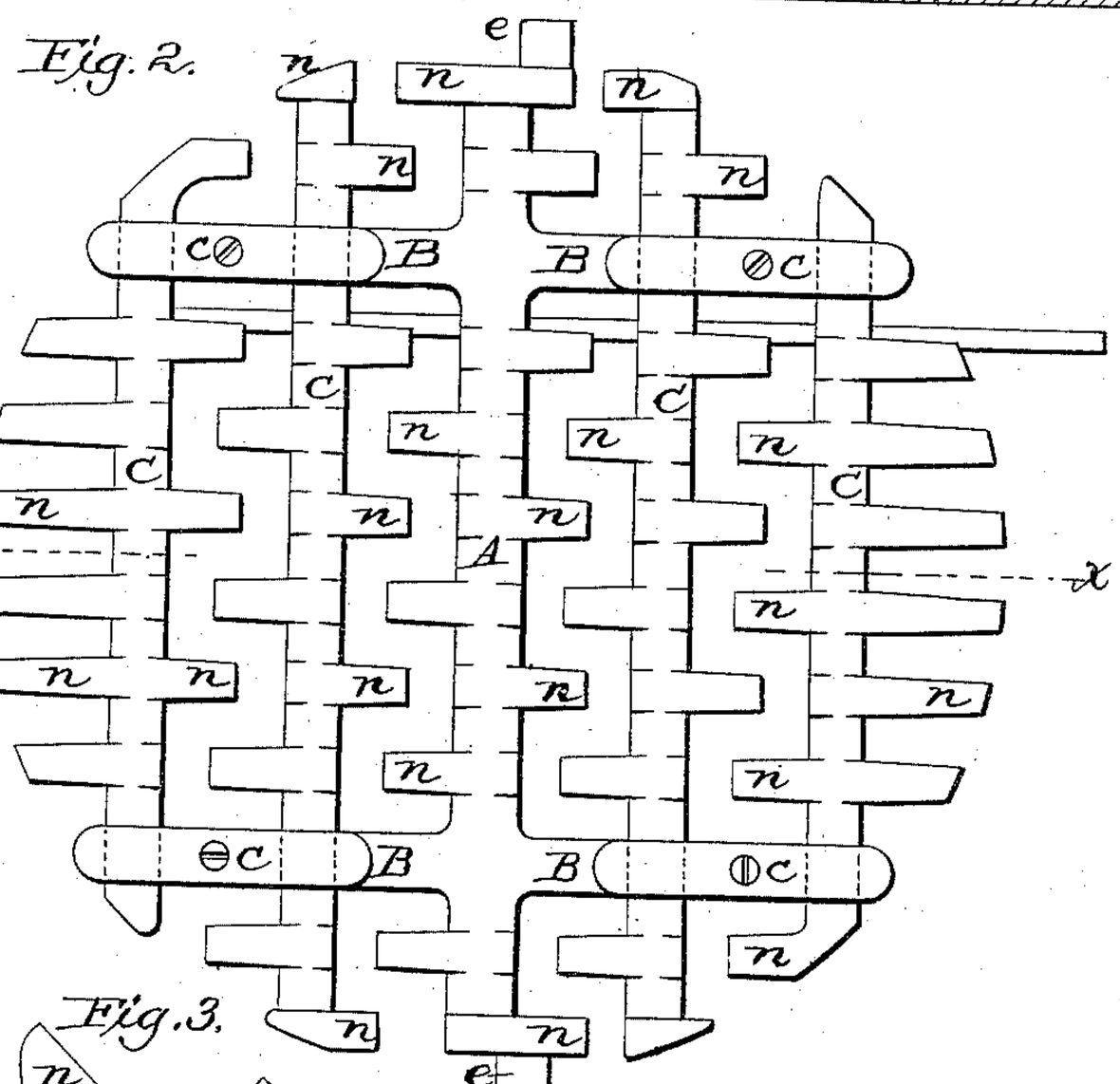
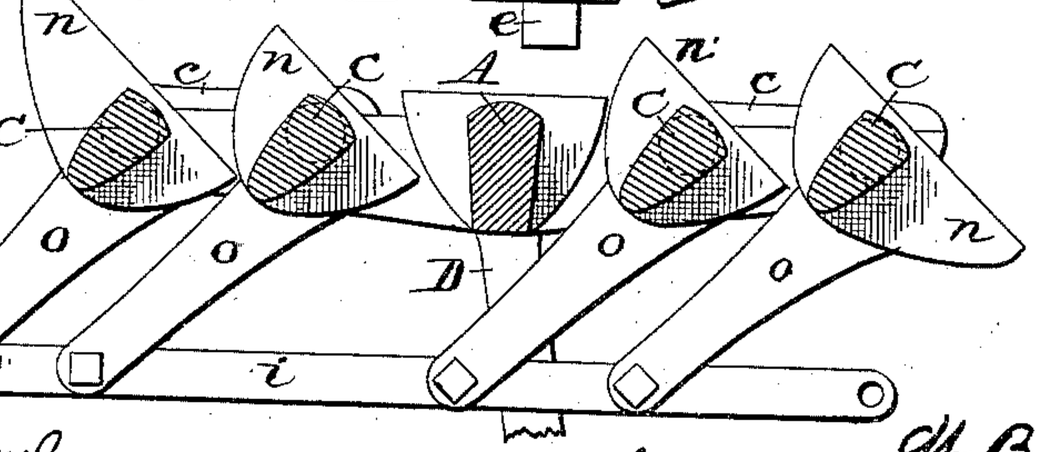


Fig. 3.



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WILLIAM B. DUNNING, OF GENEVA, NEW YORK.

GRATE.

SPECIFICATION forming part of Letters Patent No. 370,458, dated September 27, 1887.

Application filed May 7, 1887. Serial No. 237,417. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM B. DUNNING, of Geneva, in the county of Ontario and State of New York, have invented certain new and useful Improvements in Grates, of which the following is a specification.

My invention relates to grates; and the invention consists in certain details of construction, as hereinafter more fully described.

Figure 1 is a side elevation showing the grate in position, with the lower portion of a boiler and ash-pit in section. Fig. 2 is a top plan view of the grate, shown detached; and Fig. 3 is a transverse vertical section of the same on the line *x x* of Fig. 2.

My present invention belongs to that class of grates which are denominated "shaking" and "dumping" grates, and is designed more especially for use in steam-boilers, but may be used in furnaces of other kinds which have a circular fire pot or box, or, indeed, in any furnace. As these grates are usually made, they have a circular frame around the outside, in which the shaking-bars are mounted, this frame being two or more inches in width, depending somewhat on the size of the grate; and if made to tip or dump, as they usually are, this frame must clear the surrounding walls of the fire-box, the frame thus occupying considerable of the space and affording a lodgment for the ashes, which, after a little time, accumulate thereon and become gradually heaped up against the inner wall of the boiler to a height of several inches all around, and preventing the heat from being readily transmitted to the water at the bottom of the boiler.

The object of my present invention is to so construct a grate that there shall be no lodgment for ashes around the inside of the boiler or fire-box, and so that it can be readily shaken, and also tipped or dumped whenever desired.

To construct a grate on my plan, I first provide a central bar, A, which has, midway from the center toward each end, a pair of arms, B B, projecting laterally therefrom, as supports for the rocking bars C C C C, as shown clearly in Fig. 2. The arms B are provided on their upper faces with recesses for the journals of the bars C to rest in, they being held therein by a plate, *c*, bolted to each arm B, each plate *c* being of suitable length to reach across the bars on that arm, and being held in place by a bolt or screw, as shown in Fig. 2, the recesses for the journals of the bars being partially formed in the under side of the plates *c* also, so as to avoid weakening the arms B or making them unnecessarily heavy. The central bar, A, and each of the rocking bars C are provided with a series of fingers or projections, *n*, as shown in Fig. 2. These projections, instead of being set facing each other in the same plane on opposite sides of the bar, as is customary, are arranged to alternate, projecting first at one side and then at the opposite side, as clearly shown in Fig. 2. The two outer bars, C, necessarily have their outer row of fingers or projections, *n*, made continuous at uniform distances, in order to furnish the requisite support for the coal at those points, as there are no projections there to interlock or fit in between them, as there are at other points, and the outer row of fingers on each of the outer bars, C, are of varying lengths, and the fingers *n* on the bars A and C are varied in form and length, so that the outer ends of the outer tier of fingers, taken altogether, will form a circle corresponding with the size of the boiler or fire-box in which the grate is to be used.

In order to shake the grate, each of the rocking bars C is provided with a rigid pendent arm, *o*, as shown in Figs. 1 and 3, to which a bar, *i*, is pivoted, said bar at its front end being connected by a loose joint to a rod, *h*, by which the bars C can be rocked or shaken. The object of the loose joint between the bar *i* and the rod *h* is to facilitate the tipping or dumping of the grate, the joint permitting the grate to be tipped to a much greater angle than it could be if said bar extended out to or near the front of the ash-pit, as in that case the front end of bar *i* would strike the bottom of the ash-pit as soon as the grate had been tipped a short distance, when of course it could be moved no farther, whereas, by making the bar *i* only about as long as the width of the grate and connecting it by a loose joint to the shaking-rod *h*, the grate can be tipped to a vertical position, or nearly so, as shown by the dotted lines in Fig. 1.

In order to enable the grate to be tipped bodily, it is hung on journals *e*, which are cast solid on the ends of the central or supporting

bar, A, as shown in Fig. 2, these journals *e* being arranged eccentric or to the front of the axial line of said bar, thus throwing them a little to the front of the center of the grate, so that the grate will tend by gravity to tip over backward, but is held in a horizontal position by a couple of lugs, *l*, cast or otherwise secured to the wall of the ash-box I in proper position for the rigid arms B on the rear side of the grate to rest upon, as shown in Fig. 1. The central or supporting bar, A, is also provided with a rigid pendent arm, D, (shown in Figs. 1 and 3,) which has a hole in its lower end, in which the poker or any suitable rod can be hooked either permanently or temporarily, and by pushing back on the same the grate will be tipped, so as to throw the material thereon to the front, as shown by the dotted lines in Fig. 1.

By this construction I produce a grate that has all the advantages of the usual shaking and dumping grates, and that, in addition thereto, keeps the ashes and clinker from accumulating against the sides of the boiler or fire-box, thus greatly facilitating the transmission of the heat to the water in the lower portion of the boiler H.

While this grate is specially designed for use in the Dunning boiler, which is provided with a central magazine that causes the combustion to take place mainly around the magazine and near to the periphery of the grate, and consequently near the inner wall of the boiler, thereby forming ashes more rapidly at that point, it is obvious that it is equally well adapted to any boiler or furnace having a circular fire-box, and that its peripheral shape or outline may be varied to adapt it to rectangular fire-boxes, in which it can be used with the same advantage and with equal facility.

Having thus fully described my invention, what I claim is—

1. A shaking and dumping grate consisting of a central bar, A, provided with lateral supporting-arms B, with a series of rocking bars, C, journaled upon said arms and provided with means for rocking or shaking the same, substantially as shown and described.

2. In a shaking and dumping grate, the supporting-bar A, provided with the laterally-projecting arms B, journals *e*, and pendent arm D, in combination with a series of rocking bars, C, supported by said arms B and arranged to rock thereon, substantially as shown and described.

3. A shaking and dumping grate composed of a main supporting-bar provided with journals on which the grate can be tipped for dumping purposes, and a series of rocking bars supported by said main bar, and having their ends and fingers *n* projected outside of and beyond their points of support around the entire periphery of the grate, substantially as and for the purpose set forth.

In witness whereof I hereunto set my hand in the presence of two witnesses.

WM. B. DUNNING.

Witnesses:

G. W. NICHOLAS,

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