

(No Model.)

E. FALES.  
GRATE.

No. 494,373.

Patented Mar. 28, 1893.

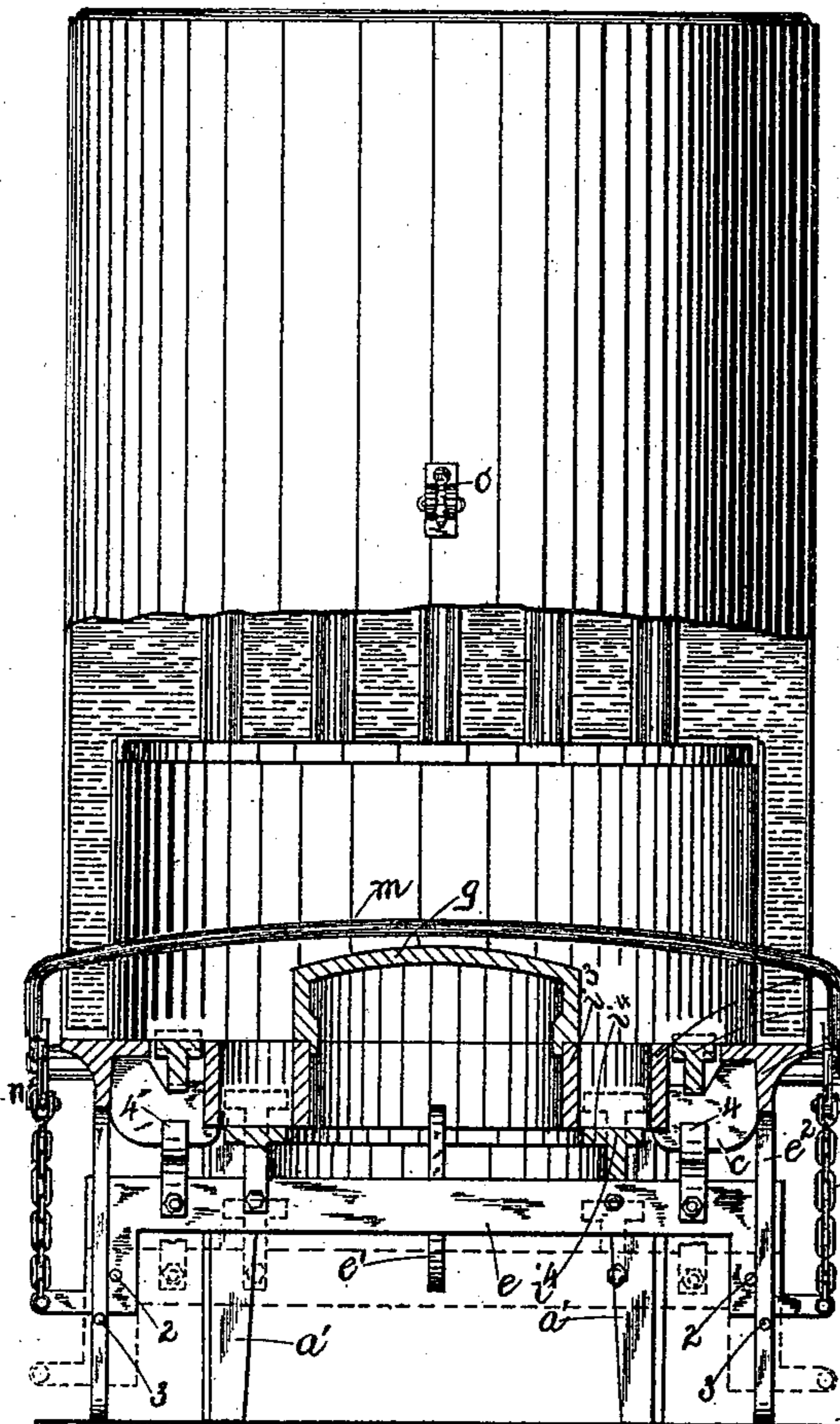


Fig. 1.

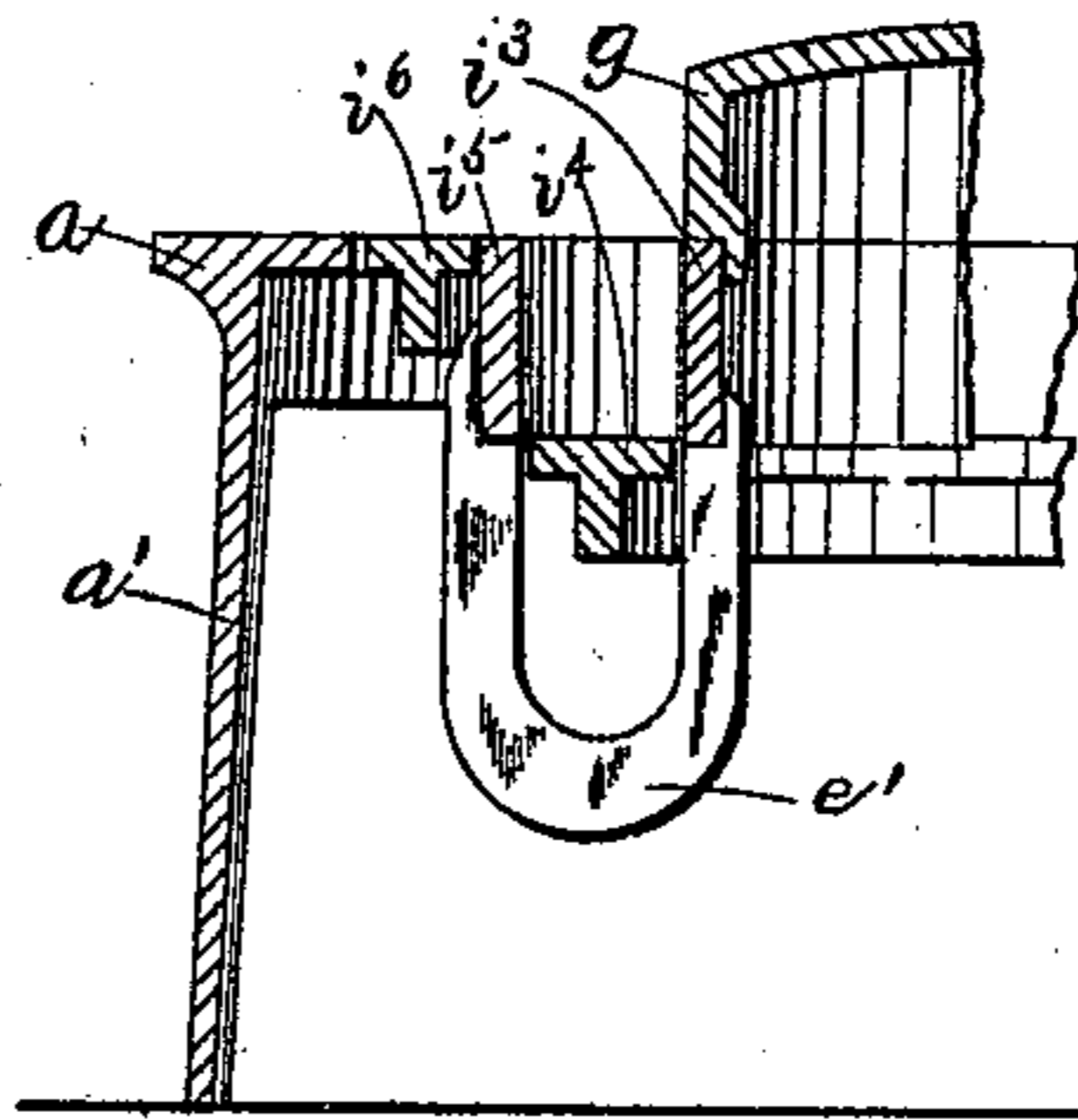


Fig. 4.

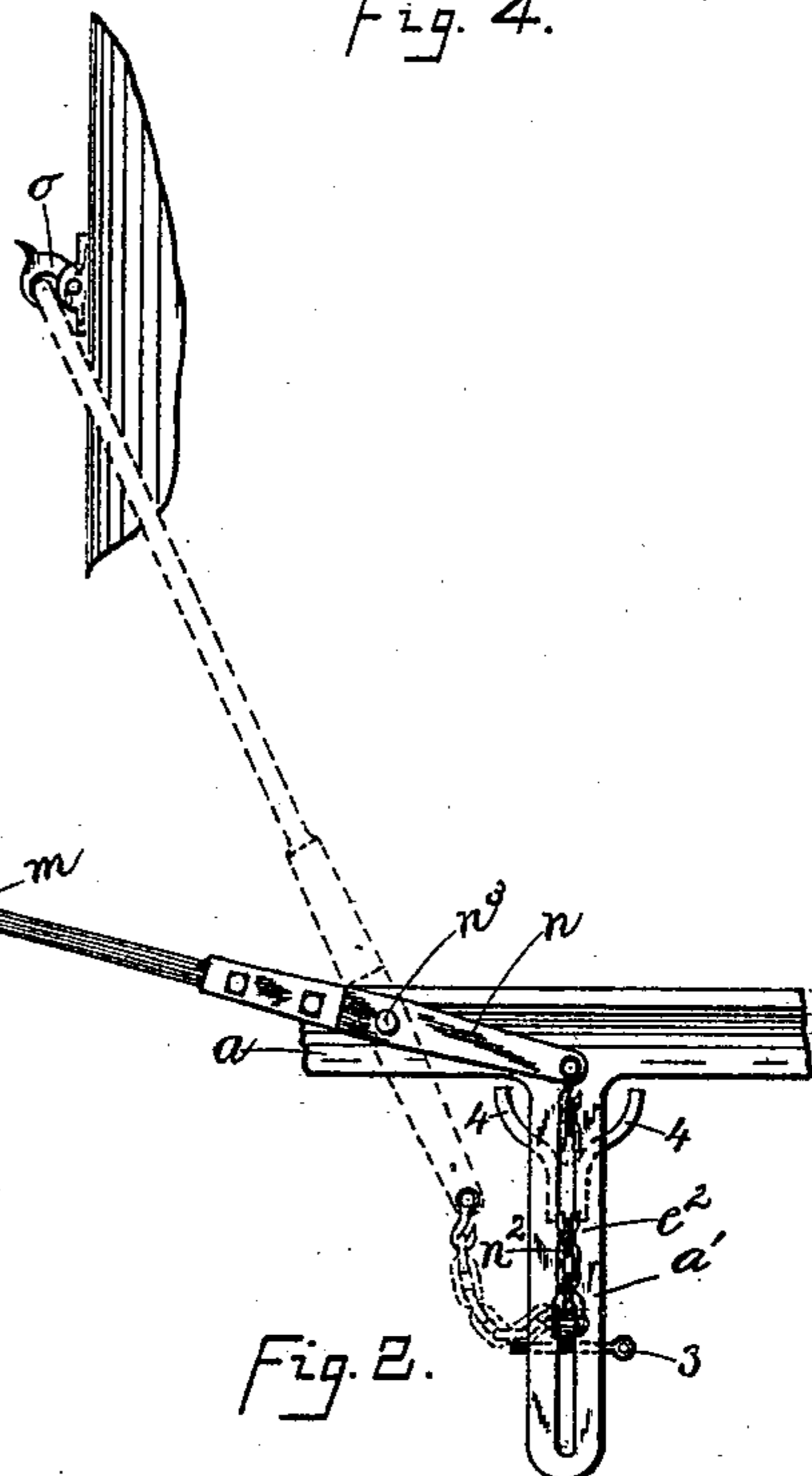


Fig. 2.

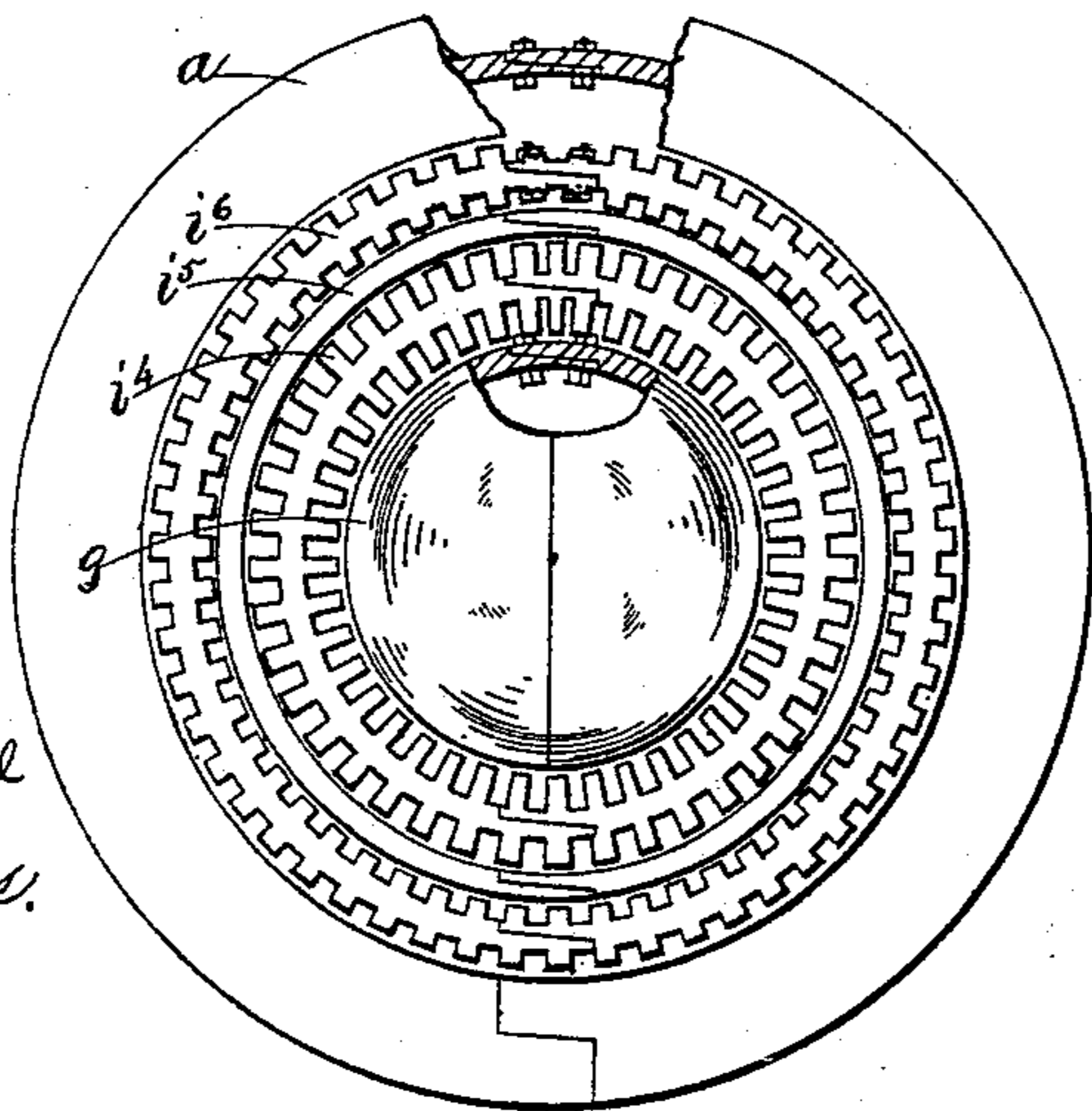


Fig. 3.

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# UNITED STATES PATENT OFFICE.

EDWARD FALES, OF BOSTON, MASSACHUSETTS.

## GRATE.

SPECIFICATION forming part of Letters Patent No. 494,373, dated March 28, 1893.

Application filed May 21, 1892. Serial No. 433,825. (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 and figures on the drawings representing like parts.

This invention has for its object to improve the construction of the shaking and dumping mechanism for the grate shown in my applications Serial No. 423,976, and Serial No. 431,501. The grate shown in said applications is composed of several concentrically arranged rings, solid and grated, and arranged to present one or more pockets, or depressed portions.

The shaking and dumping mechanism forming the subject of this invention, is adapted to move the grated rings or portions of said grate, vertically, in contradistinction to tilting them.

As a preferable way of carrying out this invention, a cross-bar is located diametrically beneath the grate, to which one of said grated rings is attached, or upon which it bears, and when two grated rings are employed, the cross-bar is provided with arms, or is so formed as to engage the under side of said grated ring, to move it vertically.

Means are further provided for moving the cross-bar, up and down vertically.

My invention therefore consists in many details of construction, to be hereinafter set forth.

Figure 1, shows in vertical section, and partial elevation, a portion of a steam boiler having a grate, and shaking and dumping mechanism therefor, embodying this invention; Fig. 2, a side view of the shaking and dumping mechanism for the grate; Fig. 3, a plan view of the grate, and Fig. 4, a detail showing the support for the inner ring or dome.

The outer ring  $a$ , is supported by suitable legs  $a'$ , or otherwise, and has formed integral with it, or secured to it, suitable supports,  $c$ , which project inwardly and support the grated ring  $i^6$ , and also the solid ring  $i^5$ , the said grated ring  $i^6$ , lying in a plane with the top of said solid ring  $i^5$ . A grated ring  $i^4$ , is contained within the solid ring  $i^5$ , and is secured to or adapted to rest upon the cross-bar  $e$ , which is arranged diametrically beneath the

concentrically arranged rings, said grated ring  $i^4$ , normally lying substantially in a plane with the bottom of the ring  $i^5$ . Lugs  $e'$ , are formed integral with, or secured to the under side of the ring  $i^5$ , which project beneath the ring  $i^4$ , and support at their outer ends a ring  $i^3$ , upon which is placed an imperforate dome  $g$ . The rings  $i^3$ , and  $i^5$ , form the side walls of a pocket or depressed portion of the grate, of which the grated ring  $i^4$ , forms the bottom. The cross-bar  $e$ , is made of suitable length to project at the ends through guide-ways  $e^2$ , formed in the legs  $a'$ , or otherwise, said guide-ways permitting vertical movement only of said cross-bar. Pins 2, are secured to said cross-bar to assist in holding it in proper position in the guide-ways, and pins 3, are secured to the legs, which limit the downward movement of said cross-bar. To each end of said cross-bar, levers  $n$ , are connected loosely as by chains  $n^2$ , or otherwise, said levers  $n$ , being pivoted at  $n^3$ , on lugs projecting from the frame, and at the opposite ends of said levers  $n$ , a bail-shaped handle  $m$ , is connected, by means of which said levers are turned on their pivots simultaneously to raise and lower the cross-bar  $e$ .

With the parts as shown in full lines Figs. 1, and 2, when it is desired to shake the fire, the bail-shaped handle is depressed, raising the cross-bar  $e$ , which carries with it the grated ring  $i^4$ , into the upper dotted line position shown in Fig. 1, and during such movement of the cross bar and just before its cessation the arms 4, secured to said cross-bar near the ends, engage the under side of the grated ring  $i^6$ , and raise it into the dotted line position shown in Fig. 1, thereby thoroughly disturbing and breaking up the bed of coal, which may be coked.

When it is desired to dump the fire, the pins 3, are withdrawn, and the cross-bar  $e$ , lowered into the lower dotted line position shown in Fig. 1, carrying with it the grated ring  $i^4$ , thereby removing the bottom of the pockets  $i^3$ ,  $i^4$ ,  $i^5$ , so that the coal will fall from each side of said grated ring.

When the shaking and dumping mechanism is not being operated, the bail-shaped handle may be turned up into the dotted line position shown in Fig. 2, and held by means of a latch  $o$ .

The several parts of the grate are herein represented as each made in two parts bolted together, as shown in Fig. 3, but I do not desire to limit my invention to the number of parts or sections of which said rings may be made.

I claim—

1. A grate composed of two independent circular grated rings, a transverse cross-bar arranged diametrically beneath and adapted to move both of said rings bodily vertically, vertical guide-ways in which the ends of said cross bar works, a pivoted lever connected to each end of said cross bar, and connecting devices for said levers, whereby they are simultaneously moved, substantially as described.

2. A grate comprising two independent grated rings located in different horizontal planes, a transverse cross-bar arranged diametrically beneath and adapted to move both of said rings bodily vertically, to shake the bed of coal, the lowermost grated ring being supported on or connected to said cross bar, to follow with it as the latter is lowered to dump the bed of coal, vertical guide ways for the ends of said transverse cross bar, and means for moving the cross bar vertically in its guide-ways, substantially as described.

3. A grate composed of two or more circular grated rings, occupying different planes, a cross bar to which one of said grated rings is connected, and arms as 4, secured to said cross-bar, adapted to engage the other grated ring, and means substantially as described,

for moving said cross-bar vertically, as and for the purposes set forth.

4. A grate composed of the outer ring *a*, supports *c*, formed integral with or secured thereto, grated ring *i*<sup>6</sup>, and solid ring *i*<sup>5</sup>, resting on said supports *c*, lugs *e*' formed integral with or secured to the under side of said ring *i*<sup>5</sup>, and ring *i*<sup>3</sup>, supported thereon, the grated ring *i*<sup>4</sup>, located between the rings *i*<sup>3</sup>, *i*<sup>5</sup>, and occupying a plane below the level of the grated ring *i*<sup>3</sup>, and means for moving said grated ring *i*<sup>4</sup>, bodily, for the purpose of dumping or shaking the bed of coal, substantially as described.

5. The grate composed of the outer ring *a*, supports *c*, formed integral with or secured thereto, grated ring *i*<sup>6</sup> and solid ring *i*<sup>5</sup>, resting on said supports *c*, lugs *e*', formed integral with or secured to the under side of said ring *i*<sup>5</sup>, and the ring *i*<sup>3</sup>, supported thereon, the grated ring *i*<sup>4</sup>, located between the rings *i*<sup>3</sup>, *i*<sup>5</sup>, and occupying a plane below the level of the grated ring *i*<sup>6</sup>, the cross bar *e* supporting said ring *i*<sup>4</sup>, and means for moving said cross bar vertically to raise and lower the ring *i*<sup>4</sup>, to disturb or dump the bed of coal, 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,  
LUCY F. GRAVES.