

(No Model.)

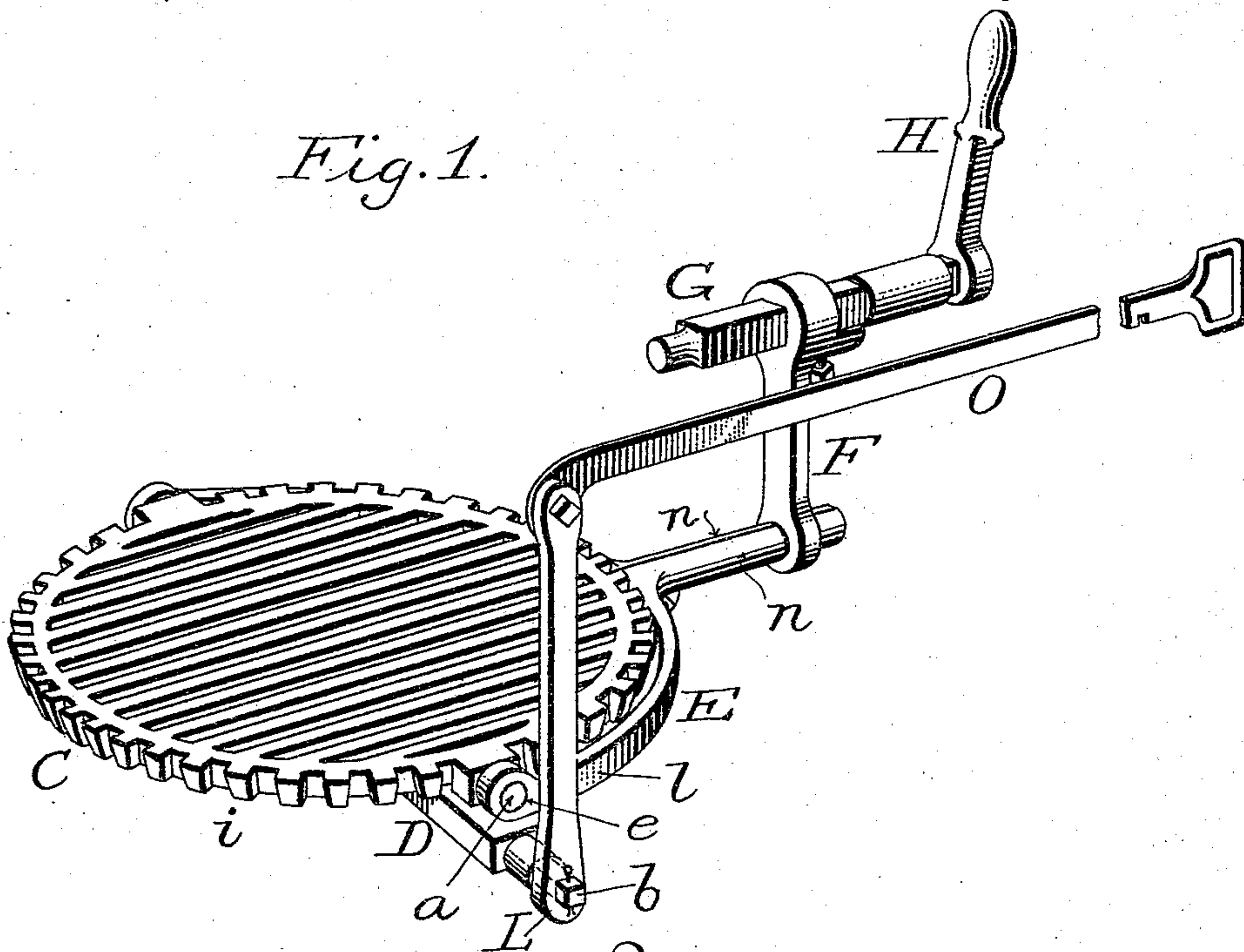
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C. P. SOPER.  
SHAKING AND DUMPING GRATE.

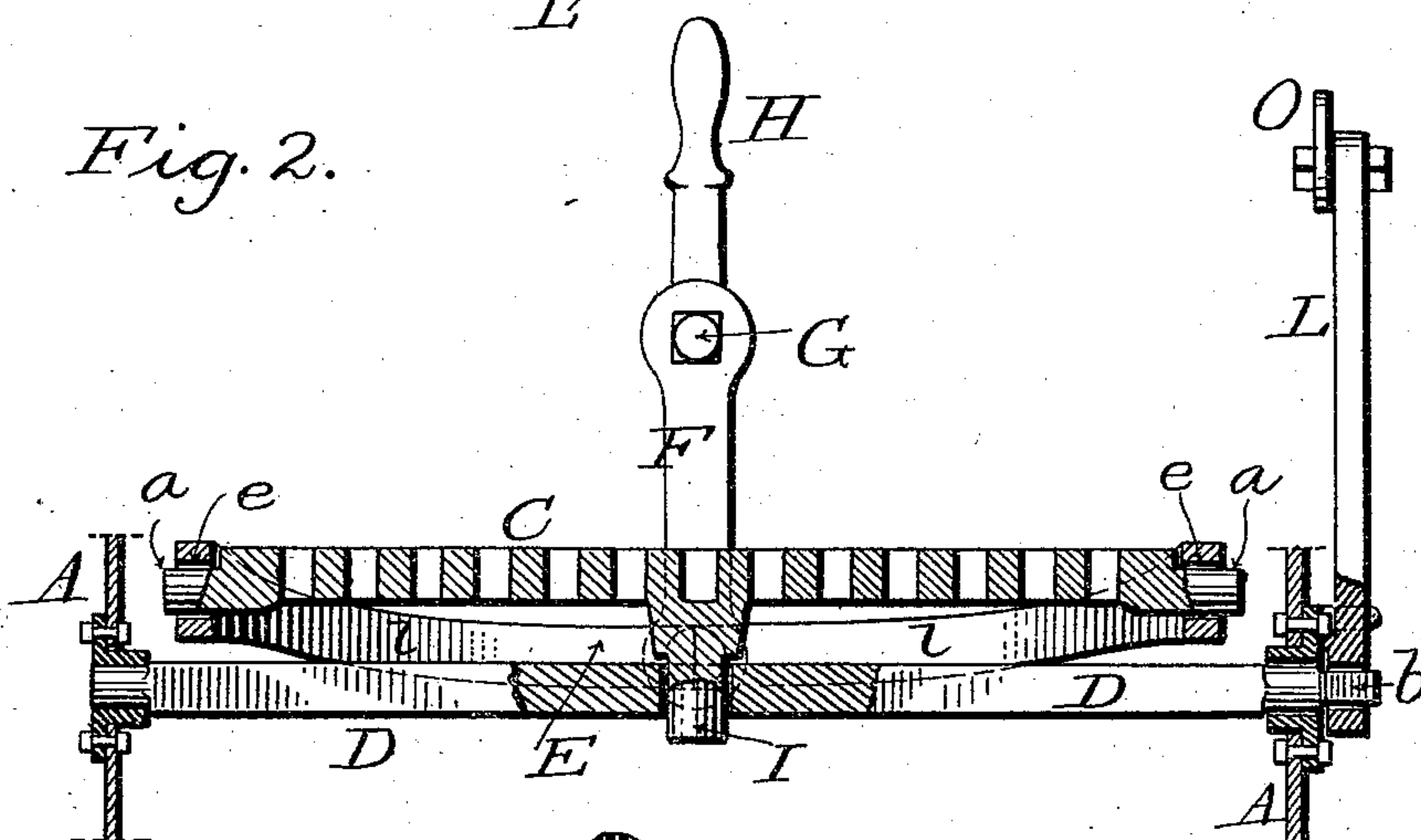
No. 543,222.

Patented July 23, 1895.

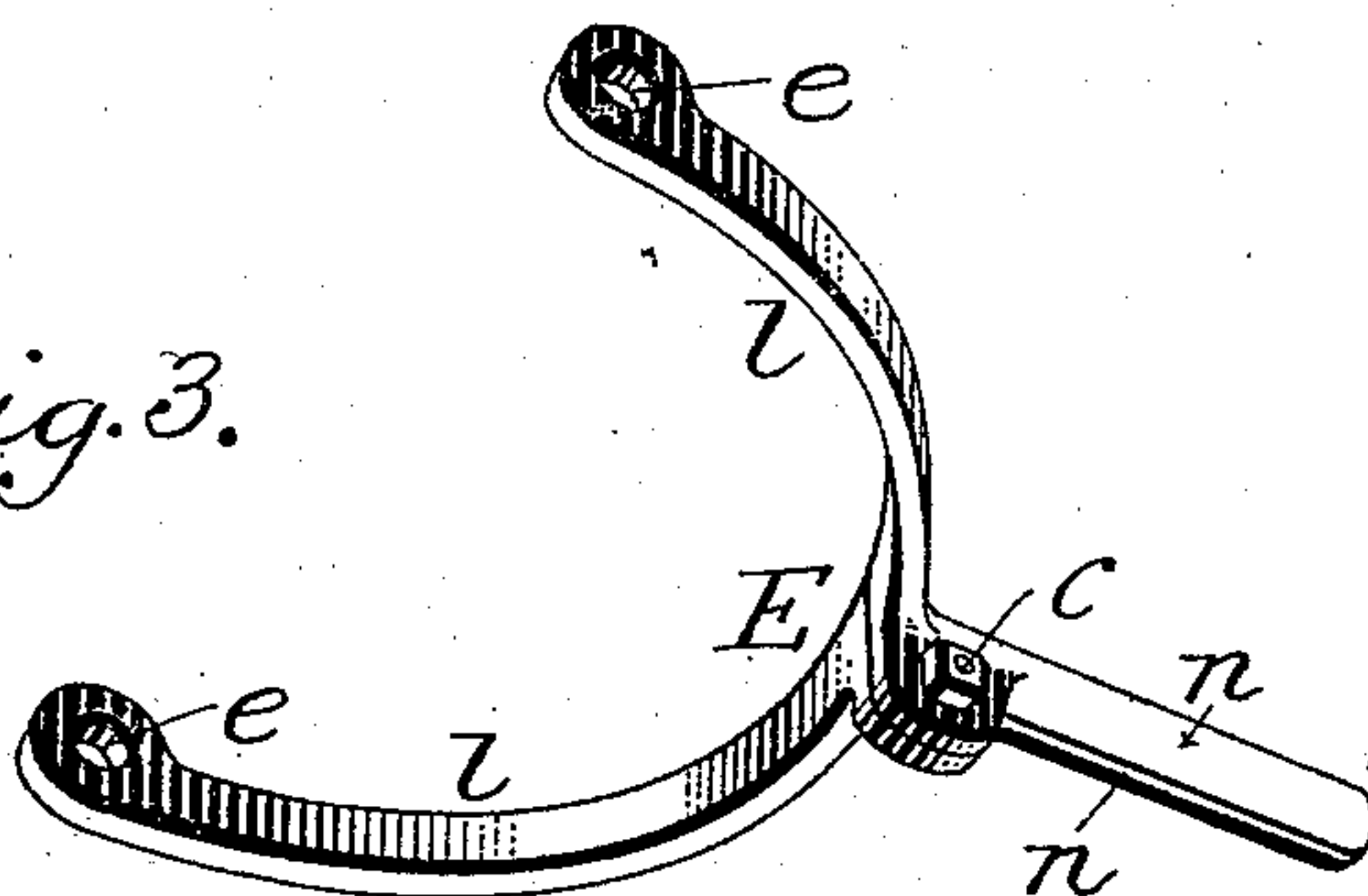
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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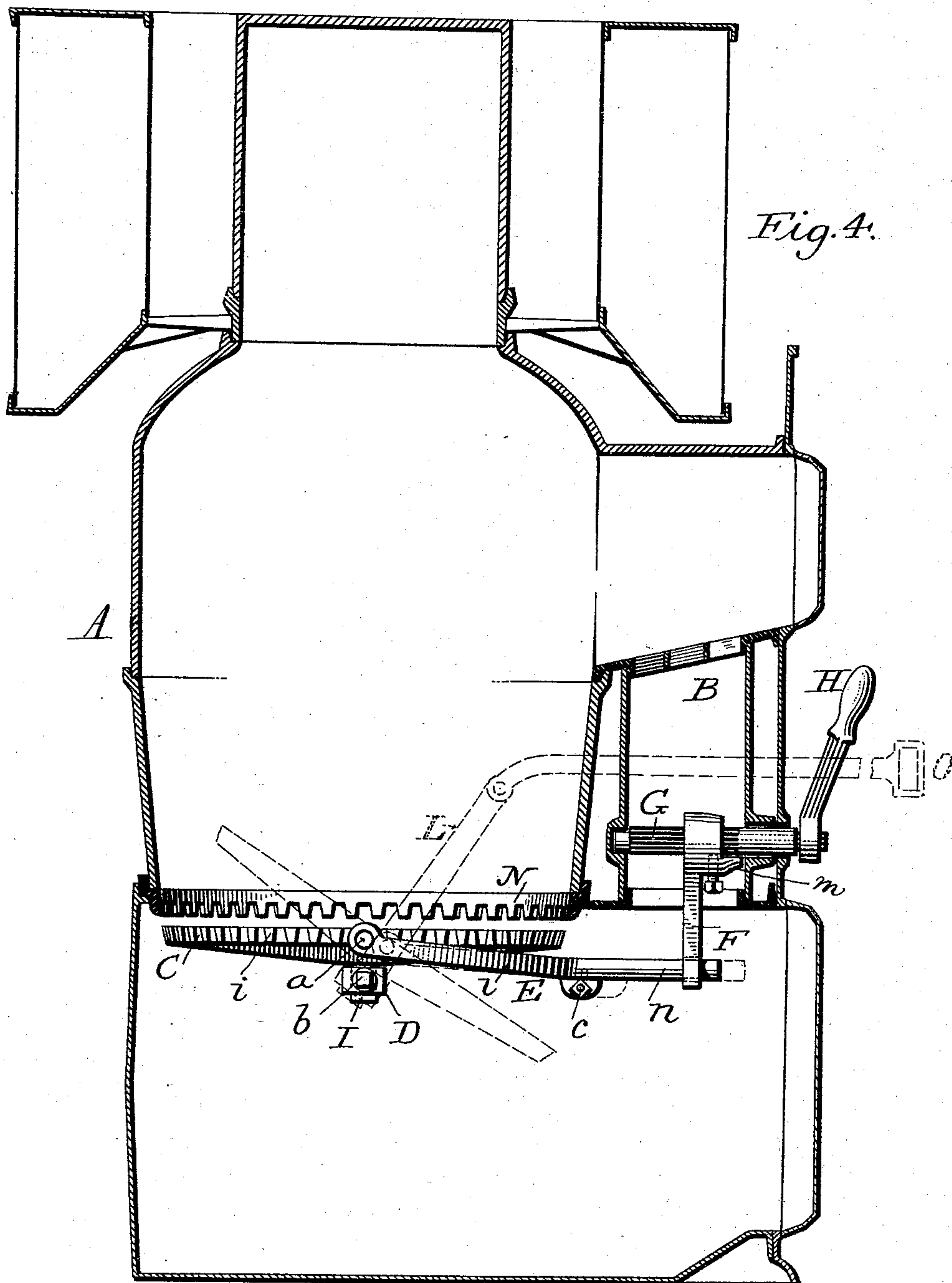
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# UNITED STATES PATENT OFFICE.

CLINTON P. SOPER, OF BLOOMINGTON, ILLINOIS.

## SHAKING AND DUMPING GRATE.

SPECIFICATION forming part of Letters Patent No. 543,222, dated July 23, 1895.

Application filed April 8, 1895. Serial No. 544,963. (No model.)

*To all whom it may concern:*

Be it known that I, CLINTON P. SOPER, a citizen of the United States, residing at Bloomington, in the county of McLean and State of Illinois, have invented certain new and useful Improvements in Shaking and Dumping Grates, of which the following is a specification.

My invention relates to grates for heating-furnaces; and the invention consists in a novel construction and arrangement of the grate and its several attachments, whereby it can be both shaken and tipped or dumped at will, all as hereinafter more fully set forth.

Figure 1 is a perspective view of the grate and its attachments, shown detached from the furnace. Fig. 2 is a side elevation of the same, partly in section; Fig. 3, a perspective view of the shaking-yoke detached; and Fig. 4 is a vertical section of the body of the furnace, showing the grate mounted therein.

The furnace for which this grate is designed is of that class which is usually inclosed with brick walls and which is provided at one side with an ash-flue located outside of the body of the furnace proper, as shown in Fig. 4, in which only so much of the furnace is shown as is necessary to show the location of the grate and its attachments and their relation to the other parts, the object being to utilize the ash-flue as a support for the shaking apparatus and to so construct the dumping apparatus that the means for operating the same shall be outside of the furnace-body.

The grate C is made circular in outline to fit the body of the furnace, and it is provided at its center with a depending stud I, as shown in Fig. 2, which stud fits in a hole in a cross-bar D and serves as a pivot for the grate when shaken.

In order to shake the grate and at the same time permit it to be dumped or tipped with facility, I provide a yoke E, formed as shown in Fig. 3. This yoke is made of two quadrant-shaped arms *l l*, each having a laterally-projecting stem *n* at their outer or adjoining ends and an eye *e* at their inner ends, as shown. These arms *l l* are exact duplicates, so that when their stems *n* are placed face to face and the two parts united by a bolt *c*, as shown, they form a rigid yoke with a long laterally-projecting stem. This yoke is at-

tached to the grate by means of its eyes *e*, which fit upon journals *a* cast on the opposite sides of the grate, as represented in Figs. 1 and 2, each arm of the yoke being applied separately and the two then being bolted together.

In order to give motion to the yoke and thereby to the grate, I provide a short rock-shaft G, which is mounted in suitable bearings on the opposite walls of a dust-flue B, at one side of the body of the furnace, as shown in Fig. 4, and on this shaft, the body of which is squared, as shown in Fig. 1, I slip a pendent arm F, the lower end of which is provided with an eye or hole of the proper size to receive loosely the projecting stem *n* of the yoke E, as shown in Figs. 1 and 4, the arm F being secured in place on the shaft G, after the parts are properly adjusted, by a set-screw, as shown. In Fig. 4 this shaft G is shown as put through a hole in the outer wall of the dust-flue B, and its inner end rests in a recess in the opposite wall, the pendent arm F being provided with a projection *m*, which, when the arm is properly adjusted on the shaft and fastened by the set-screw, as shown in Fig. 4, bears against the front wall of the flue B and thus holds the shaft securely in place. By this construction the shaking apparatus is located in the dust-flue and ash-pit, where it is less liable to be injured by the heat, and I avoid the making of any opening in the wall of the fire-pot or body for the reception of any of these parts or devices.

The outer end of shaft G is squared to receive a detachable handle or shaker H, as shown in Figs. 1 and 4. It will readily be seen that by moving this handle to and fro laterally a reciprocating motion will be imparted to the grate C around its pivot I.

In order to permit the grate to be tipped or dumped, its supporting-bar D is journaled at its ends in bearings secured to the walls of the furnace, as shown in Fig. 2. One of its ends *b* protrudes beyond its bearing and is squared to receive an arm L on the outside of the furnace, to the upper end of which a handle-bar O is pivoted, as shown more clearly in Fig. 1. By drawing the handle-bar O forward the grate, with its supporting-bar D, is rocked or tipped, as indicated by the dotted lines in Fig. 4, whenever it is required to dump the



grate, it being capable of being tipped to nearly a right angle, if desired, and thus at once clear it of cinders, &c.

5 The yoke being connected to the grate by the journals *a*, in line with the rocking bar D, and the arm *n* of the yoke being held loosely in the eye or hole of the pendent arm F, enables the grate to be tipped without any binding of the parts, the arm *n* of the yoke  
10 sliding outward in its bearing in the pendent arm F as the grate is thrown over forward, as indicated by the dotted lines in Fig. 4, and sliding back again as the grate is returned to its horizontal position.

15 The grate, as shown in Figs. 1 and 4, is provided on its periphery with a series of teeth or projections *i*, and within the body of the furnace A, I fit a ring N, which has a similar series of teeth projecting downward, as shown  
20 in Fig. 4, this ring being located just above the grate, so that when the grate is shaken or moved to and fro whatever clinker there may be around the outer edge will be caught and crushed by the teeth on the grate and the  
25 ring.

A continued movement of the grate causes the crushed clinker to work out through the space between it and the ring, and as long as there is any clinker which works outward to  
30 the edge of the grate this operation will be continued.

By this construction and operation of the grate and its attachments, together with the

toothed ring, I am enabled to provide a most efficient shaking, tipping, and clinker-crush- 35 ing grate, and to locate all the operating parts outside of the fire-pot or furnace-body.

I am aware that shaking and dumping grates have before been constructed, and therefore I do not claim such broadly; but, 40

Having fully described my improvements, what I claim is—

1. The centrally pivoted grate C provided with journals at its opposite sides, in combination with the yoke E provided with the 45 projecting arm *n*, and rock shaft G having the arm F detachably secured thereto and having its opposite end loosely connected to the projecting arm of the yoke, substantially as shown and described. 50

2. The combined shaking and dumping grate, consisting of the pivoted bar D having a rigid arm L and rod *o* for tipping the same, the grate C centrally pivoted to said bar D and having journals *a* at its opposite sides, 55 the yoke E pivoted to said journals and having its projecting arm *n* supported loosely by the pendent arm F secured to the rock shaft G, all constructed and arranged to operate as and for the purpose set forth. 60

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

CLINTON P. SOPER.

Witnesses:

NATHANIEL FROST,  
WM. ORENDORFF.