W. M. SHANKS.

Grate.

No. 196,544 Patented Oct. 30, 1877.

Fig. 1.

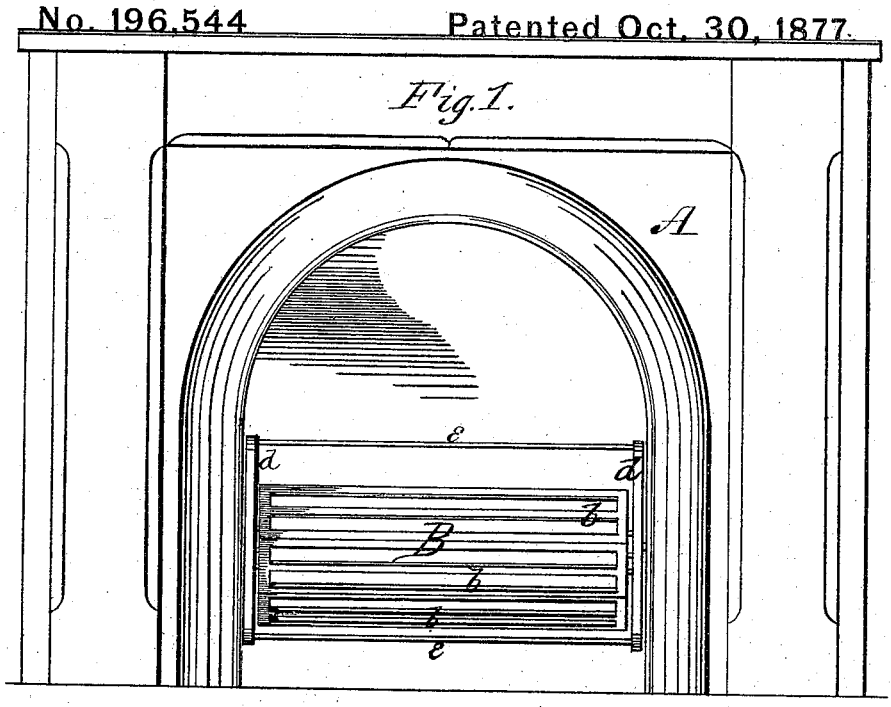


Fig. 4.

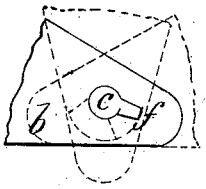


Fig. 2.

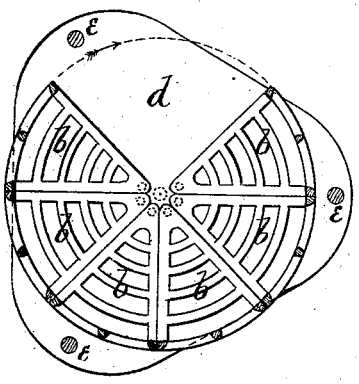


Fig. 3.

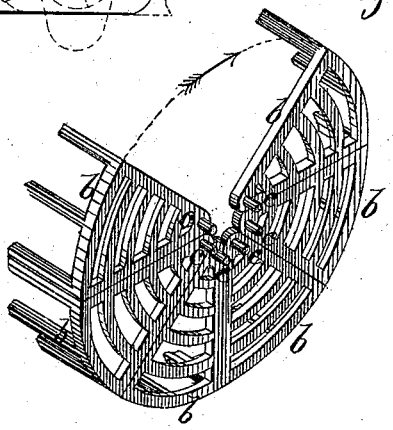
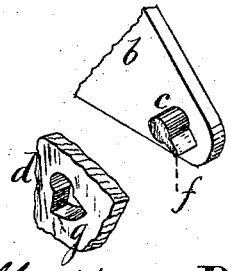


Fig. 5.



Witnesses

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WALTER M. SHANKS, OF ALLEGHENY, PENNSYLVANIA.

IMPROVEMENT IN GRATES.

Specification forming part of Letters Patent No. **196,544**, dated October 30, 1877; application filed March 20, 1877.

To all whom it may concern:

Be it known that I, WALTER M. SHANKS, of Allegheny, in the county of Allegheny and State of Pennsylvania, have invented certain new and useful Improvements in Grates; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form part of this specification, in which—

Figure 1 is a view of my grate in position. Fig. 2 is a middle transverse section. Fig. 3 is an isometric view of one end of the combined segments. Fig. 4 is an end view of one segment in three positions—previous to, during, and after tilting. Fig. 5 is a detail.

This invention relates to improvements in fire-grates; and consists in making the grate in sections, revolvable, whose cross-section shall be a hollow cylinder or polygon, with one or more sides wanting at the top, leaving an open space for the introduction of fuel and operation of the device; and in the construction and operation of parts, as hereinafter more fully described and claimed.

A represents a fire-front or fire-place, and B my improved grate applied thereto. This grate is of the form of a horizontal cylinder, made up of cylindrical segments *b*, as shown, with bars and draft-spaces arranged as desired, according to any design. These segments constitute, in section, less than the complete circle, the upper part being left open for the insertion of fuel. The segments, which are all equal in length and width, turn inwardly at their ends toward the axis, and at the axis, or at points concentric with it, are provided, at both ends, with small journals or pivot-pins *c*. I prefer the pivoting of segments *b* at a series of points concentric with the axis. The convergent ends of the segments *b* may be spaced for draft, also, if desired. The pivot-pins *c* fit into and turn in a series of openings or bearings concentric with the axis, constructed in two end plates, *d*, which are in turn axially pivoted in the side walls of fire-place, or in frames or standards resting on the hearth. The two end plates *d* are rigidly connected together by a number of stay-rods, *e*, passing along outside the path of revolution of segments *b*. Thus arranged as a major cylindrical segment, and pivoted at the axis, in turning over the segments *b* an open space always remains, which, by reason of the center of gravity lying below the pivotal line of the system, stands at the top, and makes the grate self-righting. The segments *b* being independently pivoted to the end plates, by lifting a segment next the open space across to the other side we put the system into unstable equilibrium. Stability is then automatically established by so much revolution as will again bring the open space to the highest position. The result is, of course, a partial revolution of the grate. By tilting another segment, a further partial revolution of the grate is effected, and so on at pleasure. This furnishes us a smoke-consuming grate, because, when fresh fuel is thrown in on top of the red-hot coals, we can proceed to tilt segment after segment until the fresh fuel is under the incandescent coals, and the smoke rising through these is consumed.

To make the tilting more automatic and easy, I proceed as follows: Suppose there are six segments of forty-five degrees each, leaving an opening at top of ninety degrees. In tilting, the segments then pass through an arc of ninety degrees. On each of the journals *c* I construct a rib or feather, *f*, and in their bearings in the end plates *d* I construct a concentric recess, *g*, as in Fig. 5, for the play of the feather *f*.

The operation is then as follows: By rotating the end plates *d* the segment in transit acts in this way: The feather normally lies against the upper end of the concentric recess *g* in end plate. By this the segment is supported in the horizontal position. Its tendency, in rising with the end plate, is to fall back, but is prevented by the feather meeting the recess-walls. Consequently, by forty-five degrees' rotation of end plates, the segment will have reached the vertical position above, and a slight move then causes it to lose its equilibrium, and fall over to the opposite side, its fall being broken by the opposite end of recess *g* impinging on the feather, thus causing the end plates to partially rotate to restore the general equilibrium. This renders the tilting

automatic when the end plates are rotated, prevents a hard fall of the segment in tilting, and prepares the next for transit.

If desired, a positive throw, with like results, can be given by placing an independent pin or lug on the segments between the pivot and periphery, and having it play in a concentric groove on the end plate, or vice versa. The precise method can, of course, be varied without departing from the essence of my invention.

The form of segment is immaterial, as also the contour of the end plates. Given the above cylindrical construction, it is obvious that it might, with good results, be constructed in the form of a partial sphere, an ellipsoid, a prism, or other shape, and still be capable of being made up in pivoted segments; or, instead of pivoting, the segments might be portions of a cylinder or other body, having the side edges sliding in circular grooves in the end plates, operating in a manner analogous to that of some stove-doors.

Having fully described my invention, I claim as new—

1. A self-righting pivoted grate having the center of gravity below the axis, and constructed in sections, substantially as described, whereby an automatically-determined opening is always made at the top of the grate.

2. A pivoted grate having a horizontal axis, and constructed of independent movable sections, forming an incomplete cylinder, said sections being movable concentrically about the axis, substantially as described, and for the purpose specified.

3. The combination of two pivoted end plates, *d*, rigidly connected, and a number of independent horizontal segments, *b*, pivoted thereto, the whole constituting a revolving grate and smoke-consumer, substantially as described.

4. The combination of segments *b*, having the pins *e*, with the pivoted end plates *d*, provided with a circular series of openings or bearings for the pins, substantially as shown.

5. The combination of segments *b*, having the pins *e*, with feathers *f*, with the pivoted end plates *d*, having bearings with the concentric recesses *g*, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand this 12th day of March, 1877.

WALTER MOFFAT SHANKS.

Witnesses:
A. V. D. WATTERSON,
MARSHALL BROWN.