2 Sheets—Sheet 1.

D. RICHMOND.

STOVE AND FURNACE GRATES.

No. 194,534. Patented Aug. 28, 1877

Fig. 1.

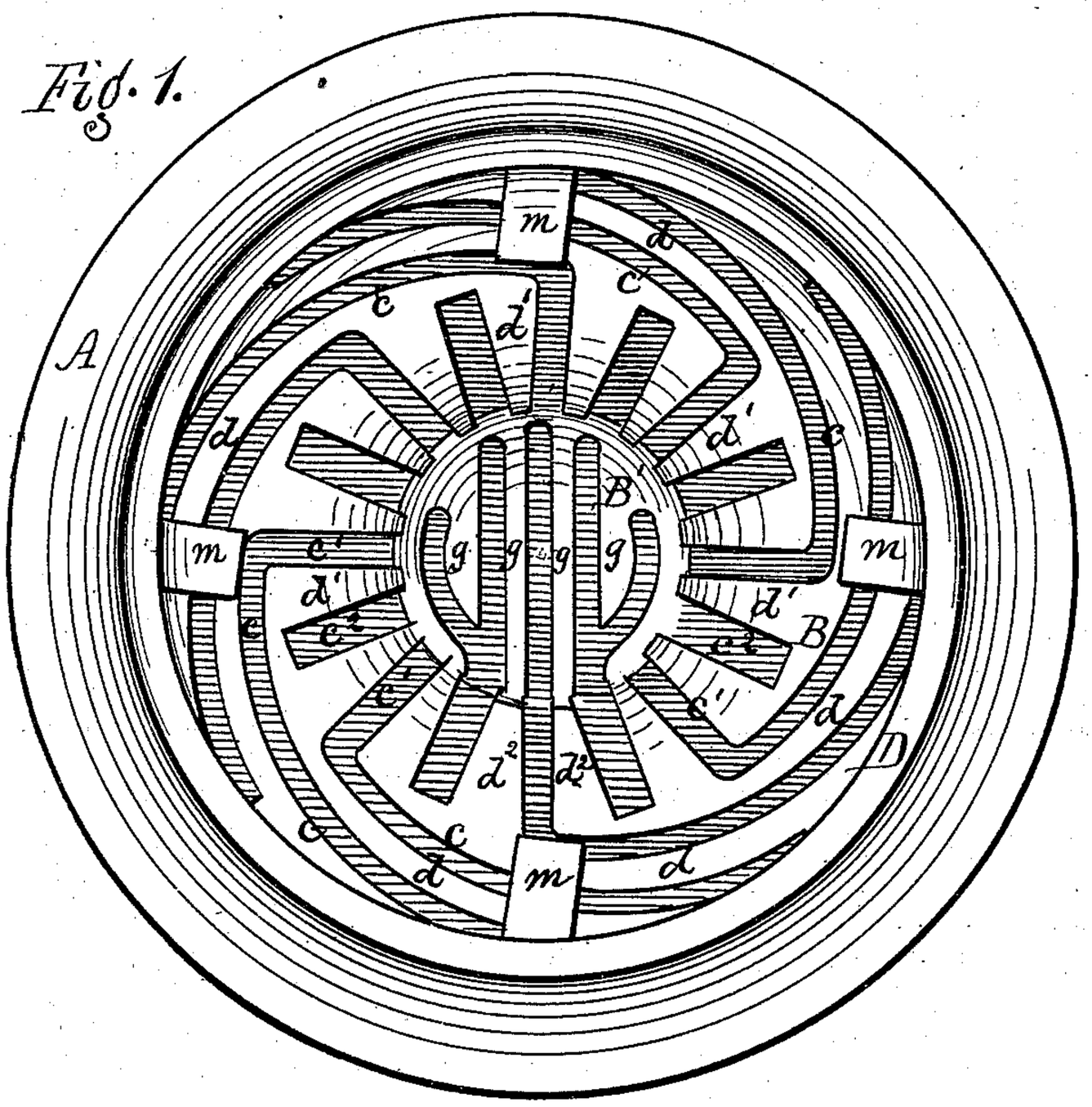
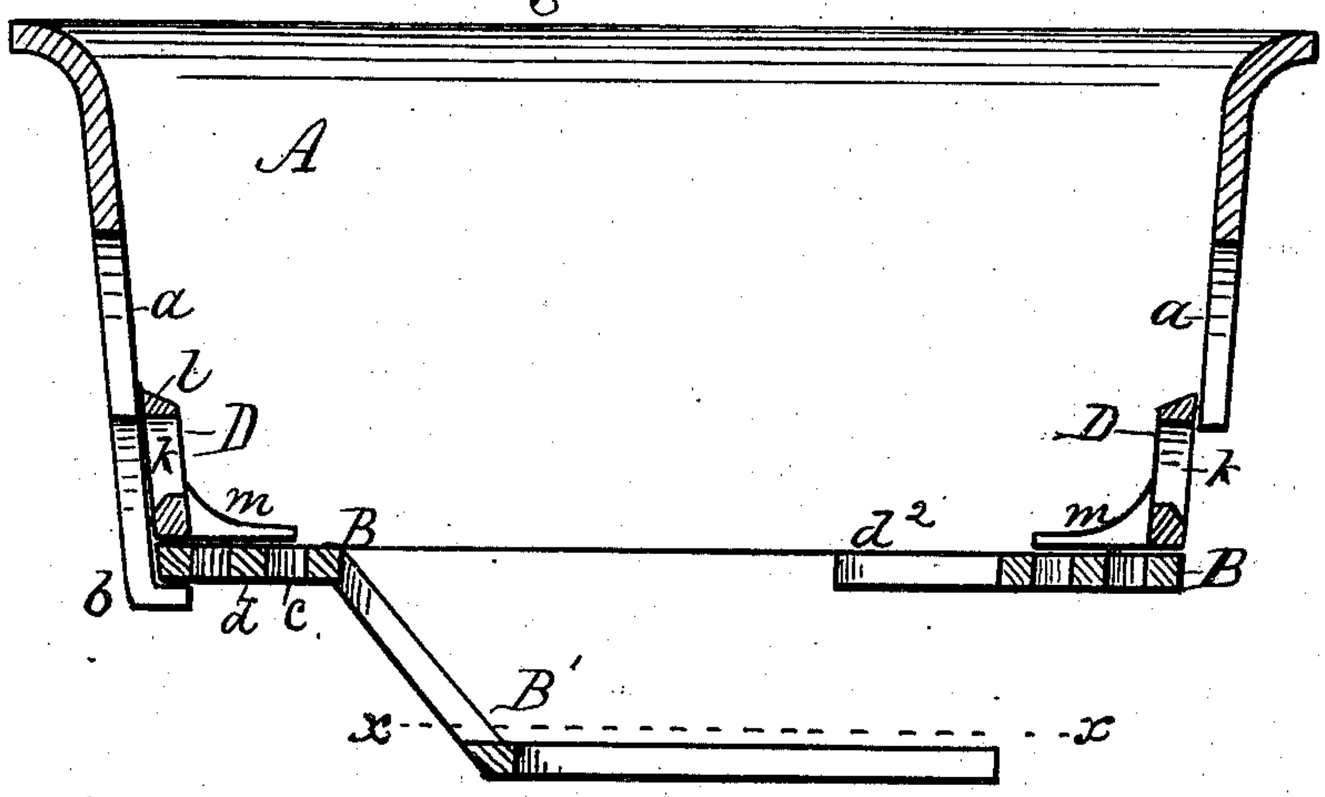


Fig. 2.



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2 Sheets—Sheet 2.

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Fig. 4.

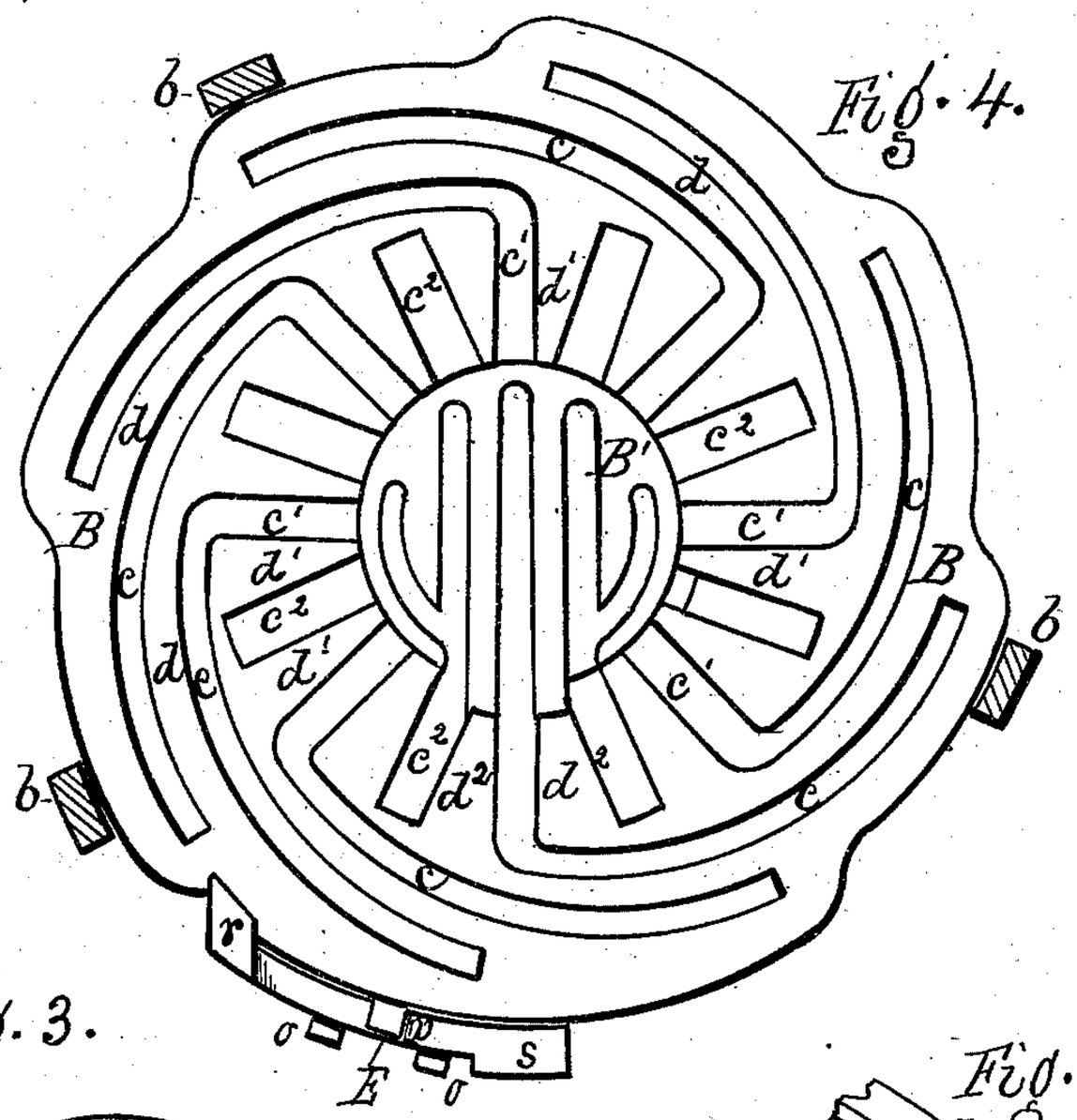


Fig. 3.

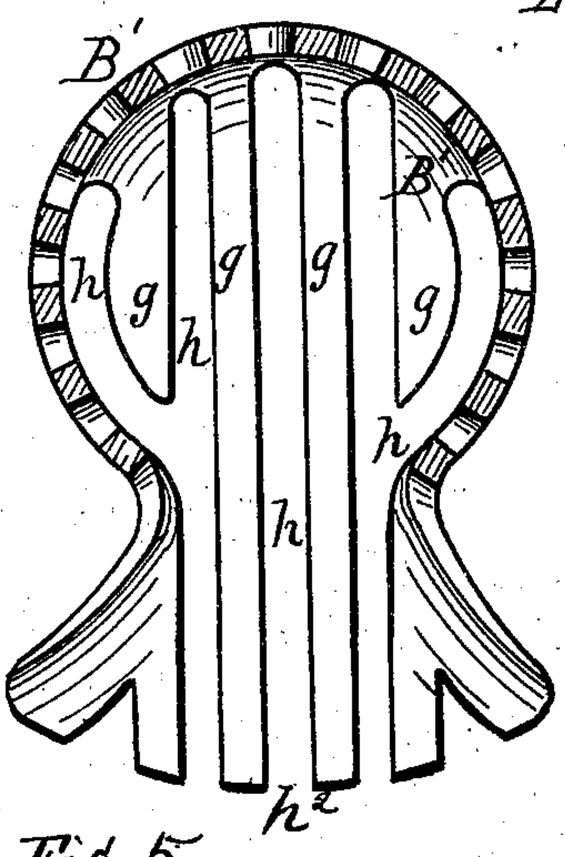


Fig. 5.

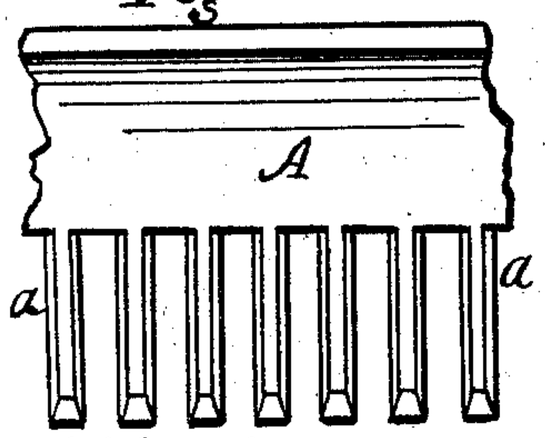


Fig. 6.

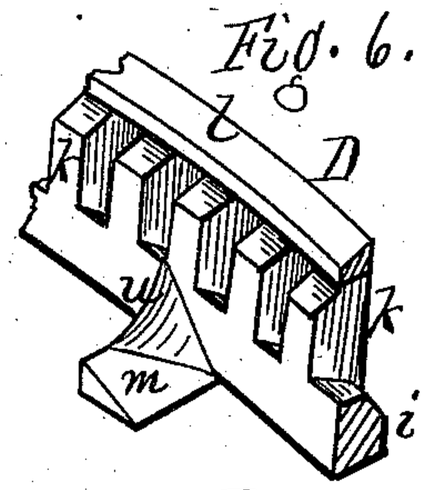


Fig. 7

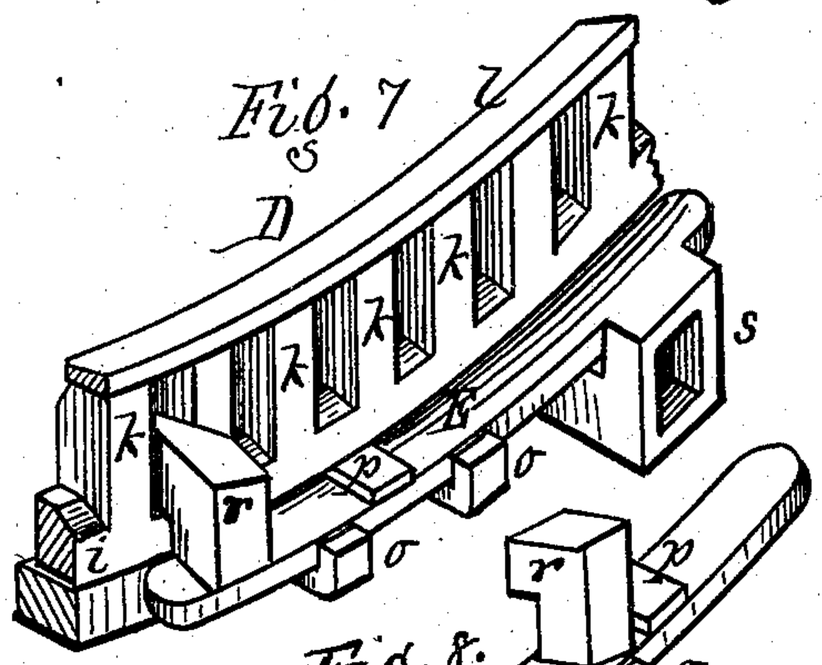
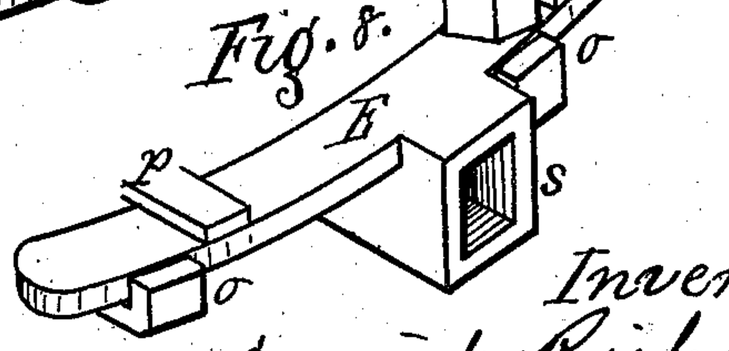


Fig. 8.



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UNITED STATES PATENT OFFICE.

DANIEL RICHMOND, OF ROCHESTER, NEW YORK.

IMPROVEMENT IN STOVE AND FURNACE GRATES.

Specification forming part of Letters Patent No. **191,534**, dated August 28, 1877; application filed March 31, 1877.

To all whom it may concern:

Be it known that I, DANIEL RICHMOND, of the city of Rochester, in the county of Monroe and State of New York, have invented a certain new and useful Improvement in Stove and Furnace Grates; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the accompanying drawings, in which—

Figure 1 is a plan, showing a fire-pot with my improved grate applied thereto. Fig. 2 is a vertical section of the same. Fig. 3 is a horizontal section in line *x x* of Fig. 2. Fig. 4 is a plan of the grate removed from the fire-pot. Figs. 5, 6, 7, and 8 are detail views.

My improvement relates to grates for stoves, furnaces, &c.; and the invention consists in the construction and arrangement of parts, hereinafter more fully described and definitely claimed.

A represents the fire-pot of a stove, which is of ordinary form at the top, but at the bottom it has grated bars *a a* forming legs, with alternate spaces extending around the whole circle. These legs occupy usually about one-half the vertical height of the fire-pot. It is formed with three or more depending arms, *b b*, having hook-heads at their bottoms, which form the bearings to support the grate.

B is the grate. It consists of a flat annular rim, B, and a basket-shaped center, B′. The rim rests on the bearings *b b* before described, and is secured thereto by pins or otherwise, so as to be stationary. In the outer annular rim are situated scroll-shaped slots *c c*, with intervening bars *d d*, forming a grated surface. These slots and bars are eccentric to the center of the grate, and draw inward from the periphery to the margin of the basket-shaped depression B′. At this point the slots *c c* turn inward at right angles, forming the extensions c^1 c^1 while the bars also turn inward, and descend, forming the extensions d^1 d^1. At the lowermost point the bars join the disk which forms the bottom of the depression. Other slots c^2 c^2 are intermediate with the extension-slot c^1 c^1, leaving two arms, d^1 d^1, to each of the bars *d*. At the front of the grate, two of the arms, d^2 d^2, stand horizontally, instead of projecting downward, for a purpose that will presently be described.

The bottom of the depression B′ also has bars *g g*, which form a grated surface. The two center-bars extend out longitudinally nearly to the mouth of the stove, while on each side are two short grates having slots outside them and partially surrounding them. This is shown most clearly in Fig. 3. These slots *h h h* between the bars all unite at the outer end in one common discharge, h^2, opening out through the front plate of the depression. By this means a hooked poker may be inserted at the back side and drawn clear out through any of the slots, and it will be guided by the slots to the front end, thereby readily removing clinkers and obviating the difficulty that occurs where the slots are inclosed.

D is a ring, resting loosely within the fire-pot and upon the grate. It fits closely to the sides of the fire-pot, and rises just above the upper ends of the legs *a a*. It is constructed with a base ring, *i*, vertical bars *k k*, with alternate spaces between them, and a rim, *l*, on top, which is formed separate, and is fastened to the top of the bars. This rim is beveled on top to throw off ashes, &c., and the tops of the bars inside the rim are beveled for a like purpose. The outer edges of the lower rim are beveled in the opposite direction. On the inside of the ring D are formed a series of lugs, *m m*, which form agitators. They are of unequal lengths, as shown in Fig. 1, and sweep closely over the annular horizontal part B of the grate. They are wedge-shaped in the direction of motion, and their rear part, at the junction with the ring, has an angular incline, as shown at *u*, Fig. 6, the object of which will be presently explained.

E is a segment at the front of the grate, below the ring D. It is secured to the edge of the grate by bearings *o o p p*, which hold it in place, but allow it to slide freely in either direction. At a suitable point it has a fixed pawl, *r*, which engages with the bars *k k* of the ring D, as with a ratchet, and at the outside it has a fixed socket, *s*, to receive the end of a shaker for operating the pawl.

The operation of this invention is as follows:

The coal being thrown upon the grate, as usual, in order to shake down the ashes the shaker is inserted in the segment-socket *s* and worked back and forth, which, by reason of the engagement of the pawl with the bars *k k*, gives a forward rotation to the ring D in one direction only. This causes the wedge-shaped lugs *m m* to run under and lift the body of coal, clinkers, &c., resting on the outer rim B of the grate, sifting the ashes through the grate, and throwing the coal, clinkers, &c., to the center, into or over the depression B′. This action is assisted by the inclines *u*, which have a tendency to push the material away from the edges of the fire-pot. By this means the outside of the fire-pot is readily cleared, and the fuel is piled in a body in the center, where the combustion is more perfect. The slots *c* c^1 and bars *d* d^1 serve as guides or leads to convey the clinkers, coal, &c., to the center of the grate as they are pushed along by the lugs *m m*.

The depression B′ may, under ordinary circumstances, be kept filled with ashes to prevent too rapid action of the fires. If desired, also, ashes may be allowed to accumulate up to the top of the legs *a a* of the fire pot, sufficient space only being left open to allow proper draft.

Whenever it is desirable to clear the depression B′ a poker can be inserted through from the front—the depressed and open form of the basket allowing the poker to be entered in almost any direction—and in drawing the poker out it is guided to the common discharge h^2 by running in any of the slots *h h*. The horizontal bars d^2 d^2, in addition to allowing the poker to be inserted up through them angularly to loosen the ashes, support the body of coal and ashes over the entrance to the grate and prevent clogging.

If desired, the bearings *b b* may be dispensed with, and the legs *a a* of the fire-pot may be extended down to the grate, and said legs and the grate, together with the fire-pot, all be cast in one piece, simplifying the construction, and rendering the device more effective; but in such case an opening must be left in front for the pawl of the segment to play in, to operate the ring D.

Having thus described my invention, what I claim herein as new is—

1. The rim D, constructed with the radial and wedge-shaped lugs *m m*, in combination with a grate, B, provided with the depressed center B′, and with eccentric slots and bars *c d*, having radial offsets c^1 d^1, leading from the elevated to the depressed portions of the grate, as shown and described, and for the purpose specified.

2. The grate B, constructed with the depressed center B′, with the eccentric slots and bars *c d*, and the radial offsets c^1 d^1, and with the overhanging straight bars d^2 d^2 resting over the entrance, as shown and described, and for the purpose specified.

3. The depressed section B′, constructed with bars *g g g*, having the intermediate slots *h h h* communicating with a common outlet, h^2, as shown and described, and for the purpose specified.

4. The combination of the grate B B′, the agitating-ring D, and the fire-pot A, provided with the depending legs *a a*, as shown and described, and for the purpose specified.

5. The combination, with the ring D, provided with the bars *k k*, of the segment E, having the pawl *r* and socket *s*, as and for the purpose described.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

DANIEL RICHMOND.

Witnesses:
R. F. OSGOOD,
JACOB SPAHN.