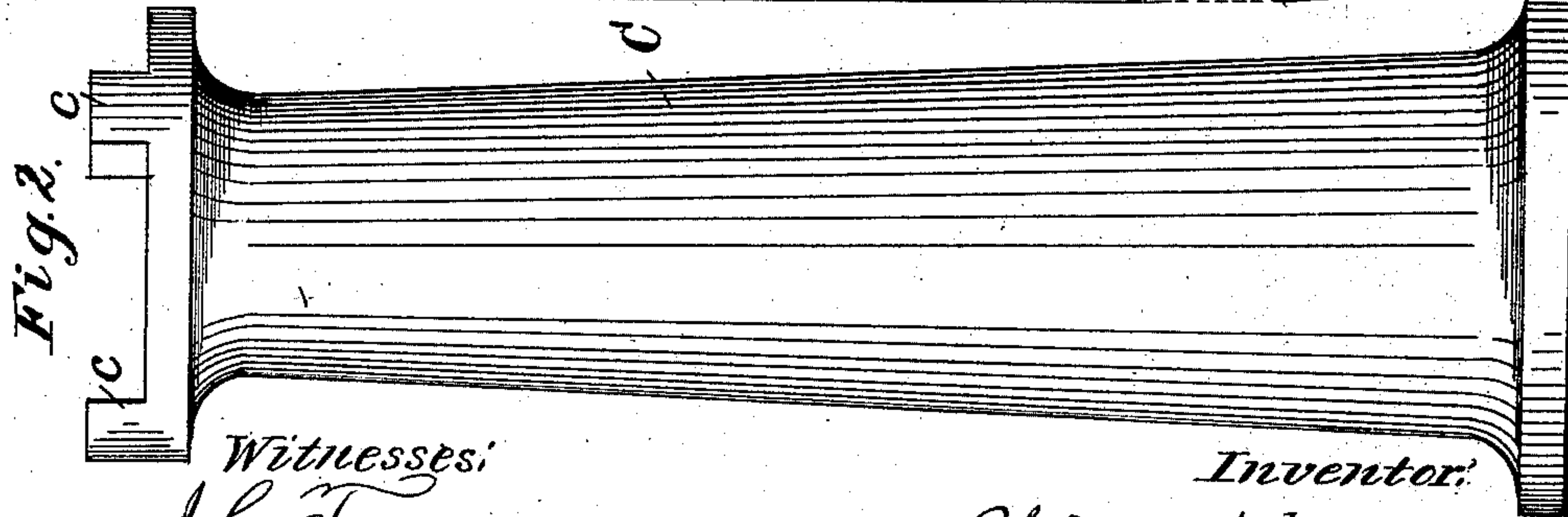
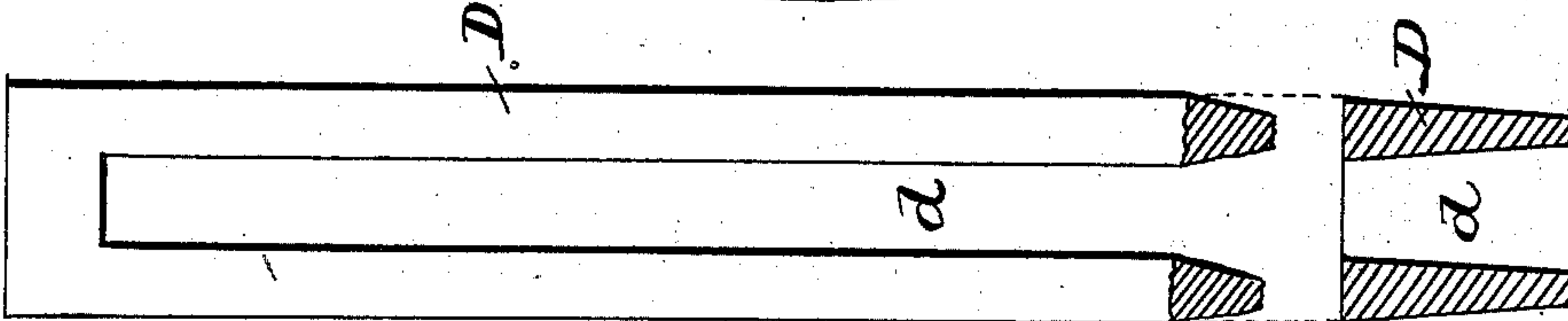
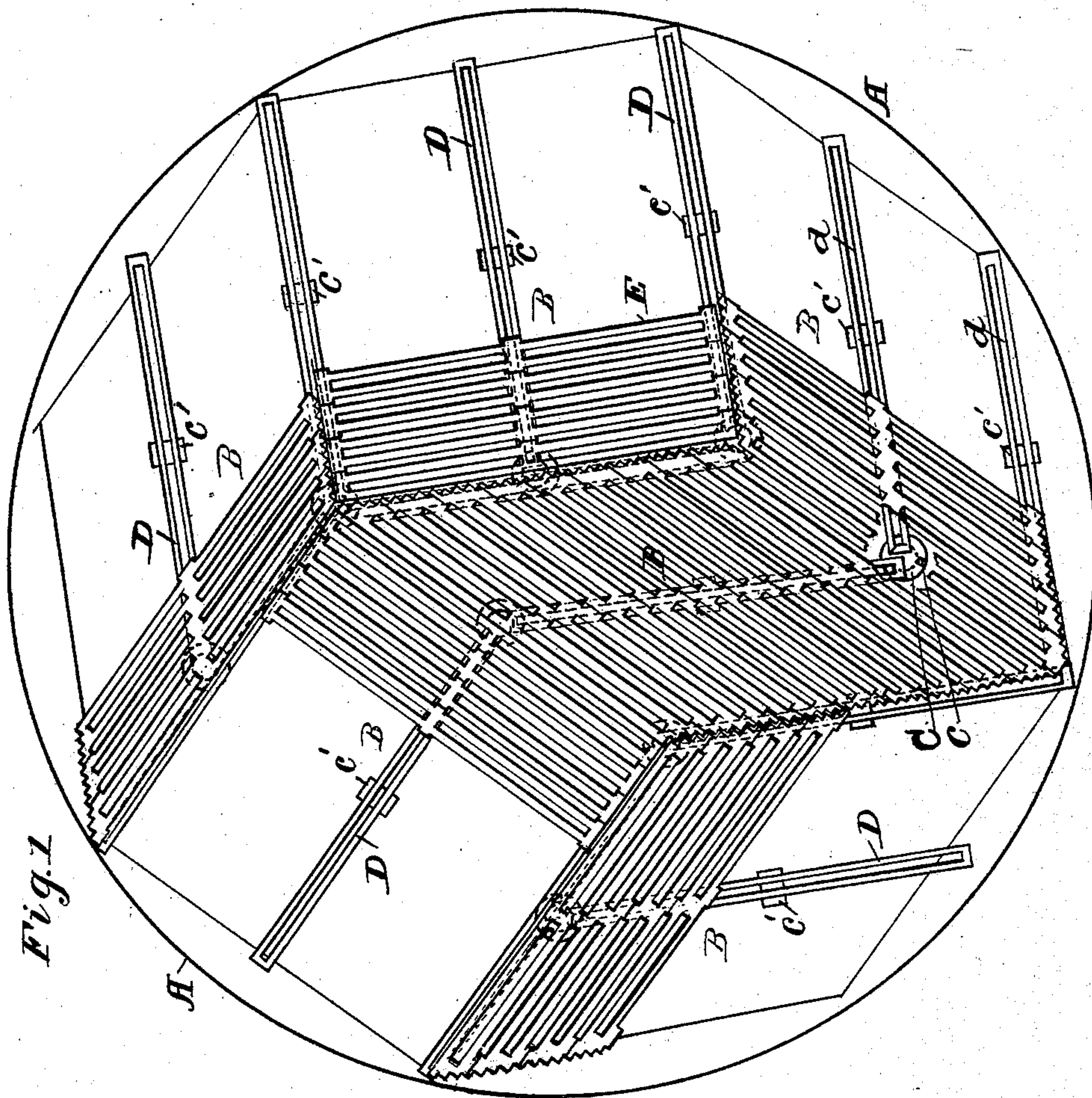


(No Model.)

P. KEENE.
GRATE FOR REFUSE BURNERS.

No. 410,104.

Patented Aug. 27 1889.



Witnesses:

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UNITED STATES PATENT OFFICE.

PHILIP KEENE, OF MOLINE, ILLINOIS.

GRATE FOR REFUSE-BURNERS.

SPECIFICATION forming part of Letters Patent No. 410,104, dated August 27, 1889.

Application filed September 22, 1888. Serial No. 286,064. (No model.)

To all whom it may concern:

Be it known that I, PHILIP KEENE, a citizen of the United States, residing at Moline, in the county of Rock Island and State of Illinois, have invented certain new and useful Improvements in Grates for Refuse-Burners of Saw-Mills, of which the following is a specification.

My invention relates to improvements in that class of burners or apparatus for getting rid of the sawdust, ratlings, and waste from saw-mills by combustion, known as "refuse-burners," usually consisting of a tall vertical cylinder, of iron or brick, a grate near its bottom, an ash-pit beneath the grate-bars, and suitable draft-holes.

It consists in a novel method of arranging the grate-bars to provide for the expansion and contraction thereof under varying degrees of heat, avoiding their liability to twist or bend out of shape, and consequently rendering the grate more durable, more easily to be replaced when necessary and more effective in use.

Refuse-burners of the class above mentioned are constructed with an ash-pit either partially or wholly below the surface of the ground, draft-holes slightly above the surface and below the grate-bars, and like draft-holes above such grate-bars. They are made cylindrical in form and extend a considerable distance upward—say a hundred or more feet, this great height affording a powerful draft. In the side of this cylinder at some distance from the grate is a hole or chute for supplying the waste materials thereto. In the burners heretofore constructed the grate is composed of sections, the form most commonly adopted being segments resting upon a central support and supports upon the wall with suitable center supports; or the segments may be divided in their length into two or more sections, and there are no means provided for their expansion or contraction under different degrees of heat. By my improvement this defect is remedied and a burner provided which is at once simple, durable, and inexpensive.

In the drawings, Figure 1 is a plan view of my improved grate, showing the method of displaying my grate-bars. Fig. 2 is a detail

of one of my grate-bar standards, and Fig. 3 is a detail of one of my grate-bar rests or supports.

A represents the inner surface of the cylindrical wall of the burner.

BBBBB B are independent grate-sections, in this case the six combined forming the complete grate.

C is one of my grate-standards; D, a grate-bar rest or support, and E one of my grate-bars.

It will be noticed that I arrange my bars in groups; in this case six—two squares and four parallelograms; but I do not limit myself to this precise number nor to the shapes shown and described herein. Further, I do not limit the adaptability of my invention to the peculiar construction of burner here described, as I think it will prove effective when used in connection with any other construction. However, for convenience, I will describe my improvements as embodied in a burner such as above mentioned, and as displayed in a grate containing six groups or sections of grate-bars of the shapes shown in Fig. 1.

From the bottom of the ash-pit, preferably upon brick or other foundation pillars, are placed the standards C, constructed with vertical lugs *c*. These standards are so arranged that when the grate-bar rests D are slipped on the lugs *c* thereon the figures inclosed by such rests connecting the four standards of each group will present for the entire grate two squares and four parallelograms. For a further support to the rests and the bars thereon I place an additional standard *c'* immediately between the end standards. The grate-bar rests or supports D are preferably constructed, as shown, with a central slot *d*, running substantially from end to end, and the ends of such slot are placed over the lugs *c* on the standards, the body of the metal on the support beyond such slot preventing their longitudinal displacement when once adjusted. The grate-bars are displaced at right angles to the grate-support, and are held upon such supports by gravity simply, no other attachment being necessary. It is obvious that by this arrangement the grate-bars in each group have an ability to expand and contract inde-

pendently of the bars in any other group. Their capacity in this direction is not limited by the expansion or contraction of those of any other group. The expansion longitudinally
5 of the bars of any group is at an angle to the bars of its opposing groups, and affords ample room to allow of such expansibility without crowding such opposing bars, and at the same time requiring no appreciable vacant
10 space to be left between the ends of the bars to provide for such expansion, and by these means preventing the liability or possibility of any bending or warping of the bars by their ends coming in contact in the process of
15 expansion. Again, by the use of single bars running the entire width of the furnace-grate, or sections, segmental or otherwise, composed of several bars, greater strength is secured, less liability to break or warp is obtained, and
20 facility to handle in constructing a burner or removing a bar is accomplished.

I claim—

1. In a refuse-burner for saw-mills, a grate composed of independently-movable bars ar-

ranged in groups, the bars in each group being at an angle to those in adjacent groups. 25

2. In a refuse-burner for saw-mills, a grate composed of independently-movable grate-bars arranged in groups, the bars forming a group being disposed in the same direction 30 and each group being disposed at an angle to an adjacent group.

3. In a refuse-burner for saw-mills, the grate composed of independent grate-sections B B B B B, each section formed by several in- 35 dependently-movable bars, and displayed as herein described.

4. The combination, in a refuse-burner for saw-mills, of the grate composed of several independent sections formed by groups of 40 single grate-bars E, the grate-standards C, and the grate-supports D, all constructed and arranged as herein set forth.

PHILIP KEENE.

Witnesses:

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