(No Model.) 2 Sheets—Sheet 1.

S. J. MILES.

GRATE FOR BURNING HARD COAL SLACK.

No. 454,490. Patented June 23, 1891.

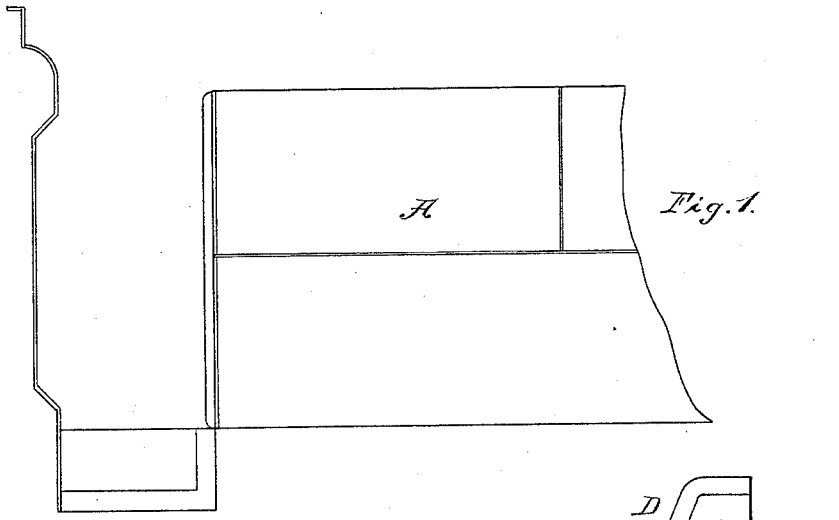
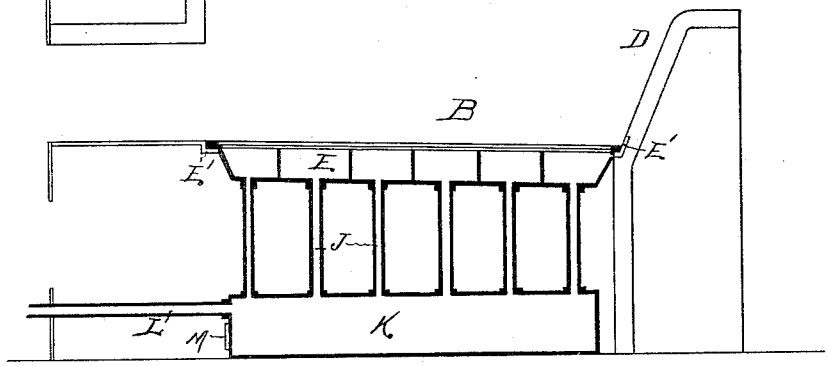


Fig. 1.



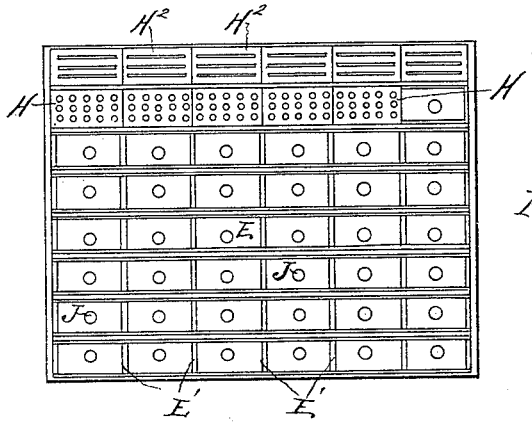


Fig 2

Witnesses
Jean Elliott
Celeste P. Shepman.

Inventor
Samuel J. Miles
By his Attorney Marcus W. Parker

(No Model.) 2 Sheets—Sheet 2.

S. J. MILES.

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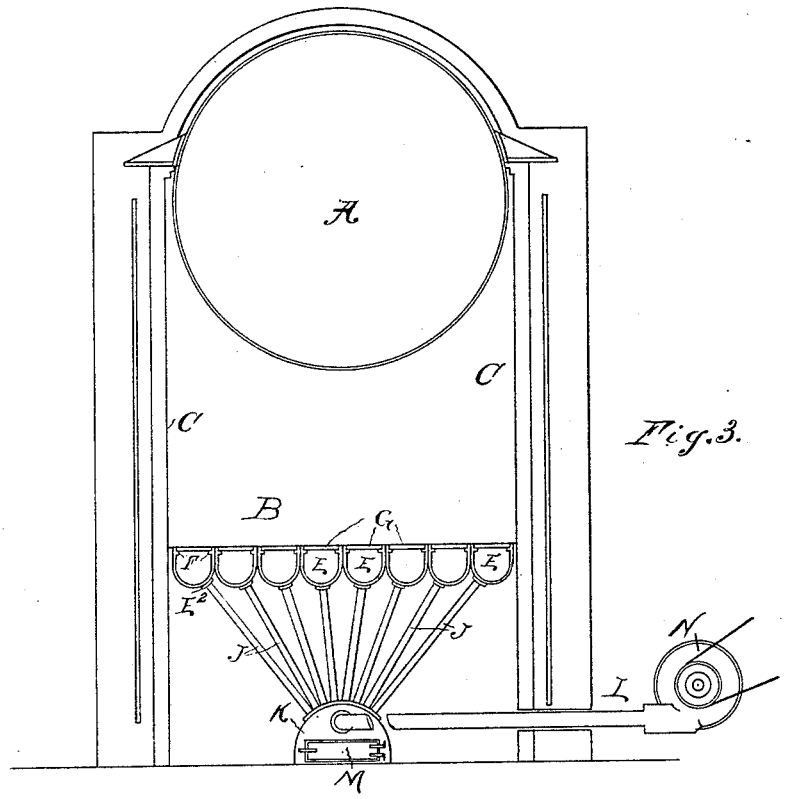

Fig. 3.

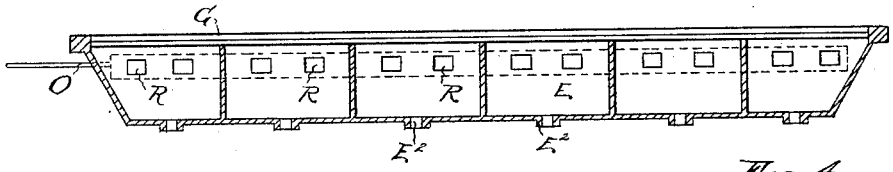

Fig. 4.

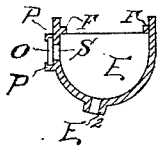

Fig 5

Witnesses
Jean Elliott
Celeste P. Shepman.

Inventor
Samuel J. Miles
By his Attorney Francis W. Parker

UNITED STATES PATENT OFFICE.

SAMUEL J. MILES, OF CHICAGO, ILLINOIS, ASSIGNOR TO FERDINAND SIEGEL, OF SAME PLACE.

GRATE FOR BURNING HARD-COAL SLACK.

SPECIFICATION forming part of Letters Patent No. 454,490, dated June 23, 1891.

Application filed October 23, 1889. Serial No. 327,921. (No model.)

To all whom it may concern:

Be it known that I, SAMUEL J. MILES, a citizen of the United States, and a resident of Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Grates for Burning Hard-Coal Slack and the Like, of which the following is a specification.

My invention relates to grate-bars and attachments designed especially for burning hard-coal screenings and the like. It is illustrated in the accompanying drawings, wherein—

Figure 1 is a side view of a portion of the boiler and fire-box. Fig. 2 is a plan view of the grate-bars in position. Fig. 3 is a front view with the front portion of the fire-box removed. Fig. 4 is a longitudinal section of one bar, and Fig. 5 a cross-section of the same.

Like parts are indicated by the same letter in all the figures.

A is a boiler; B, a fire-box; C, the sides thereof.

D is the bridge-wall.

E E are the hollow grate-bars placed longitudinally in the fire-box and supported on the ledges E′ E′.

F F are ledges within such grate-bars, upon which rest the perforated lids G G, the same being in sections, if desired, as shown in Fig. 2, and perforated by the apertures H H, as indicated, or by the slots H^2 H^2, as also indicated.

J J are pipes leading each from the distributing-box K to one of the grate-bars E E.

E′ E′ are transverse partitions in the grate-bars, whereby they are divided into sections and greatly strengthened, and into each one of such sections opens one of the pipes J.

E^2 E^2 are nipples on the grate-bars, by means of which the pipes J are connected thereto.

L is a pipe leading from the fan N to the distributing-box K.

M is a door in one end of such distributing-box, by means of which it may be cleaned.

O is a slide moving along between the ledges P P in the side of the grate-bars E E and perforated at R R, so as, when desired, to uncover the perforations S S in the side of the grate-bar and permit of a natural draft in the event of the forced draft not being used.

The use and operation of my invention are as follows: The fan N being in operation, a current of cold air, or, if desired, of hot air, taken from a suitable source, is directed with any desired velocity through pipe L into the distributing-box K. Thence it passes through the various pipes J J into the hollow grate-bars E E. From these bars it passes upward through the holes H H in the covers G and through the slack-coal distributed over the surface of such bars. By this means this slack is kept loose and is sufficiently mingled with the air to permit of its combustion. Should any of the dust or slack or particles of coal drop backward through the apertures H H in the covers, it will pass down from such grate-bars through the inclined pipes J, thence to the distributer K, in the bottom of which it would accumulate. From this distributer it can be easily removed by opening the door K′ and drawing or pulling it out by hand or forcing it out by an air-current. By this means the clogging of the grate-bars and air-pipes is prevented. When the blast of air is forced up through the pipes J coming from the distributing-box K, it will supply a sufficient draft to support combustion in the fire-box; but if for any reason this means of furnishing a draft should be dispensed with by moving the slide and uncovering the apertures in the side of the grate-bars a sufficient draft can be furnished directly through such grate-bars. The transverse walls in the grate-bars strengthen them and prevent twisting, warping, and breaking. The making of the lids or top of the grate-bars in section is calculated to permit the easy and rapid removal and replacement of injured forces, and the condition of any part of the grate-bars can easily be ascertained at any time by raising one or more portions of the lids.

Any desired means for connecting the air-pipes J J with the distributing-box and with the grate-bars may be employed, it only being necessary to make such connections as would permit the easy removal of the various parts.

The pipes J J may be made of any desired material, size, and shape, as experience may find necessary for any given work.

The slots or long narrow apertures in the hollow grate-bar lids are found to be specially

valuable in furnaces of this character, as the small round apertures are likely to be clogged up by the small particles of the fuel; but the long apertures or slots, if clogged at any given point, will speedily burn such clogging particles out, and thus free themselves, as the iron about such particles has no chance to cool.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is as follows:

The combination of a series of hollow grate-bars with a distributing-box below the same, an air-supply pipe leading into the same, and a series of inclined air-pipes leading from such distributing-box to the hollow grate-bars.

SAMUEL J. MILES.

Witnesses:
FRANCIS W. PARKER,
CELESTE P. CHAPMAN.