C. F. HILL.
Stove.

No. 216,677. Patented June 17, 1879.

Fig. 1.

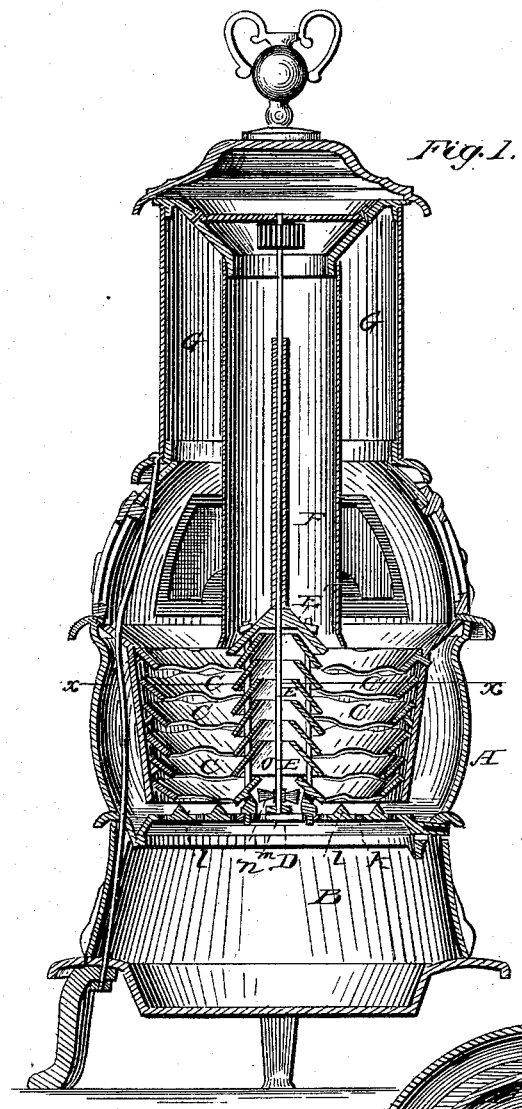



Fig. 2.

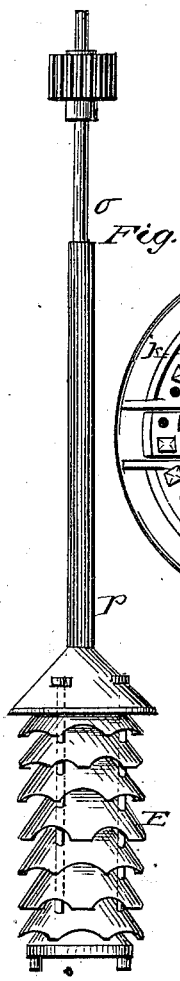



Fig. 3.

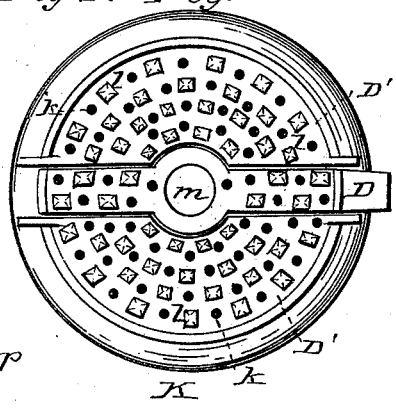
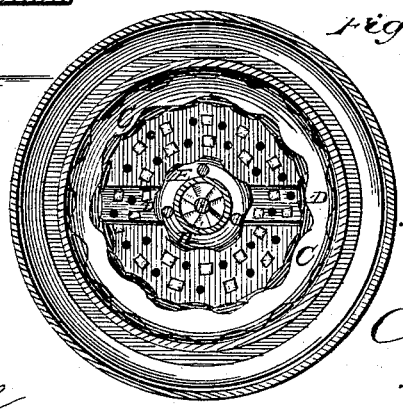



Fig. 4.

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# UNITED STATES PATENT OFFICE

CHARLES F. HILL, OF HAZLETON, PENNSYLVANIA.

## IMPROVEMENT IN STOVES.

Specification forming part of Letters Patent No. **216,677**, dated June 17, 1879; application filed April 7, 1879.

*To all whom it may concern:*

Be it known that I, CHARLES F. HILL, of Hazleton, in the county of Luzerne and State of Pennsylvania, have invented certain new and useful Improvements in Stoves; and I do hereby declare that the following is a full, clear, and exact description of the invention, which will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

Figure 1 is a vertical sectional view of my improved stove for burning coal-waste or "culm." Fig. 2 is a side view of the cylindrical grate. Fig. 3 is a plan view of the lower grate; and Fig. 4 is a cross-section on the line *x x*, Fig. 1.

Similar letters of reference denote corresponding parts in all the figures.

My invention relates to certain improvements in stoves, the object of which is to enable culm (coal-waste) or the very fine grades of anthracite coal to be readily consumed. The difficulty heretofore experienced in this class of stoves or furnaces has been the apparent impracticability of suppyling a sufficiency of air for the perfect combustion of the gases which are so freely generated by this kind of fuel. This objection, however, I overcome by the peculiar construction and arrangement of parts, which I shall now proceed more fully to describe, with reference to the drawings, in which—

A represents the outer cylinder of my improved stove, which is suitably supported upon the ash-box B. Although I term it "cylinder," it is not necessarily cylindrical in shape, but may be polygonal, egg-shaped, or of any other desired form. Its inner side is provided with a series of circumferential downward-slanting projections or ledges, C C, of cast-iron, the inner sides or edges of which are provided with openings or scallops, substantially as shown in the drawings, in order that a draft of air may pass through them by the inner side of the body of the cylinder.

Upon a cross-bar, D, over the ash-box I support what I term the "cylindrical grate." This is a cylinder constructed, substantially as shown, of cast-iron rings E and a solid top or cap, E′, suitably connected, and each slanting downwardly toward the fire-box, as shown. Air passing from the ash-box upwardly through the cylinder will also pass between the open-work grate bars or rings into the fire-box.

Over the cylinder-grate is arranged a reservoir, F, for culm, which is fed from there into the fire-box. Said reservoir, the mouth of which surrounds the conical cap of the cylindrical grate, is surrounded by a flue, G, which, it will be seen, is a direct upward continuation of the fire-box.

B is the ash-box. Upon this, and forming the bottom of the fire-box, is a grate or bottom, K. This consists of the central piece or cross-bar, D, upon which, as above stated, the cylindrical grate is supported, and to which it is detachably but firmly connected, and at the sides of which the side pieces, D′ D′, are hinged. The side pieces may be supported in a horizontal position by any suitable device, the withdrawal of which permits the said side pieces to drop down, thus emptying the fire-box.

The entire grate K, which is arranged to be oscillated or shaken by any suitable means, is provided with suitably-sized openings *k*, alternating with upward projections *l*, the former admitting a draft of air, and the object of the latter being to stir the fuel contained in the fire-box.

It has been already stated that the cylindrical grate is supported upon the central portion or cross-bar, D, of grate K. It should be added that the latter is provided with an opening, *m*, registering with the central passage or opening through the cylindrical grate, and that the latter is provided with a rotary fan, *n*, the operating-rod of which, *o*, passes upward through a tube, *p*, projecting upwardly from the top or cap of the cylindrical grate. Any suitable mechanism may be employed to operate said fan, the suction of which forces the air from the ash-box up through the cylindrical grate until it strikes the top or cap thereof, when it is deflected between the rings of said grate downward into the fire-box. This fan is no necessary adjunct of my invention; but it may be used advantageously, especially in starting the fire.

From the foregoing description, and by ref-

erence to the drawings hereto annexed, it will be seen that a strong draft of air is provided both centrally through and circumferentially by the sides of the fire-box. The tendency of the fuel which I design to use to cake or lump together, thus making it difficult or impossible to supply a sufficiency of air even with the best of draft, is overcome by my peculiar improved construction of the fire-box, hereinbefore described, which makes such caking to any considerable extent quite impossible, and by which, under all circumstances, a free and perfect draft is provided centrally as well as circumferentially in the fire-box.

I will here state that in order to loosen or break the fuel as it is being fed into the fire-box the projections or ledges C C and the rings or bars of the cylindrical grate may be made of varying widths, or of increasing width from the top to the bottom, as represented in the drawings.

Having thus described my invention, I claim and desire to secure by Letters Patent of the United States—

1. In a stove or furnace for burning culm or coal-waste, an annular fire-box provided upon its outer walls with downward-projecting ledges, and having its inner walls formed by a cylindrical grate consisting of suitably-connected rings slanting from the inner to the outer side, substantially as and for the purpose herein shown and specified.

2. In a stove or furnace for burning culm or coal-waste, the combination of an oscillating fire-box bottom, a cylindrical grate fixed upon said oscillating bottom and having a conical top piece or cap, and a fuel-reservoir arranged around and above said top piece or cap, and surrounded by a flue or combustion-chamber, forming a direct upward continuation of the annular fire-box, as set forth.

3. The combination, with the cylindrical grate provided with a suitably-operated rotary fan, of the fire-box bottom or grate having a central opening directly below the central opening or passage in the cylindrical grate, in which said fan is placed, substantially as herein set forth.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

CHARLES F. HILL.

Witnesses:
C. W. KLINE,
J. G. RUDDIMAN.