(No Model.) 2 Sheets—Sheet 1.

C. H. MILLER.

COMBINED GAS AND COAL BURNING GRATE.

No. 362,648. Patented May 10, 1887.

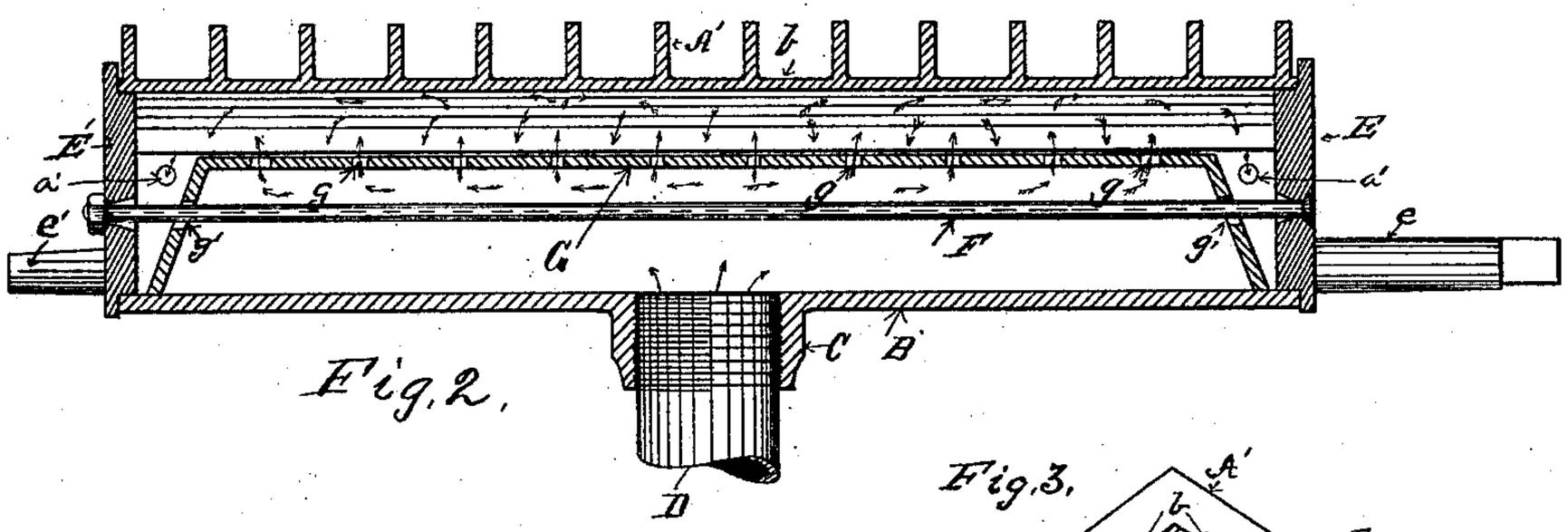


Fig. 2.

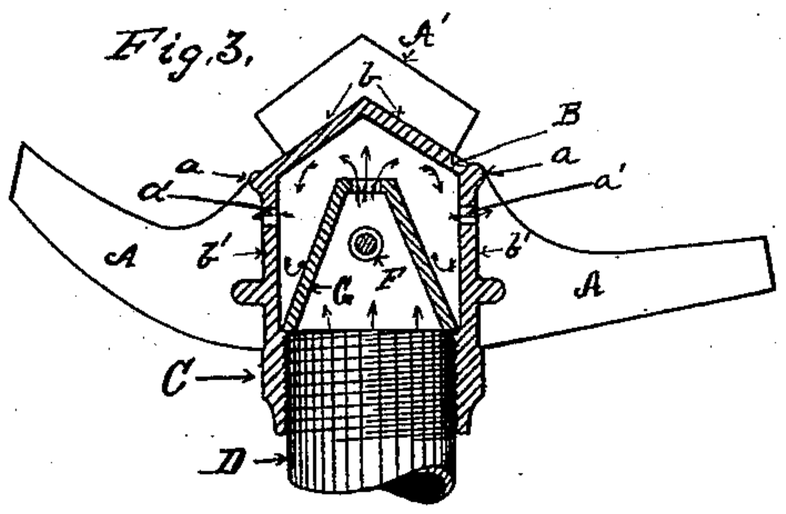


Fig. 3.

Fig. 1

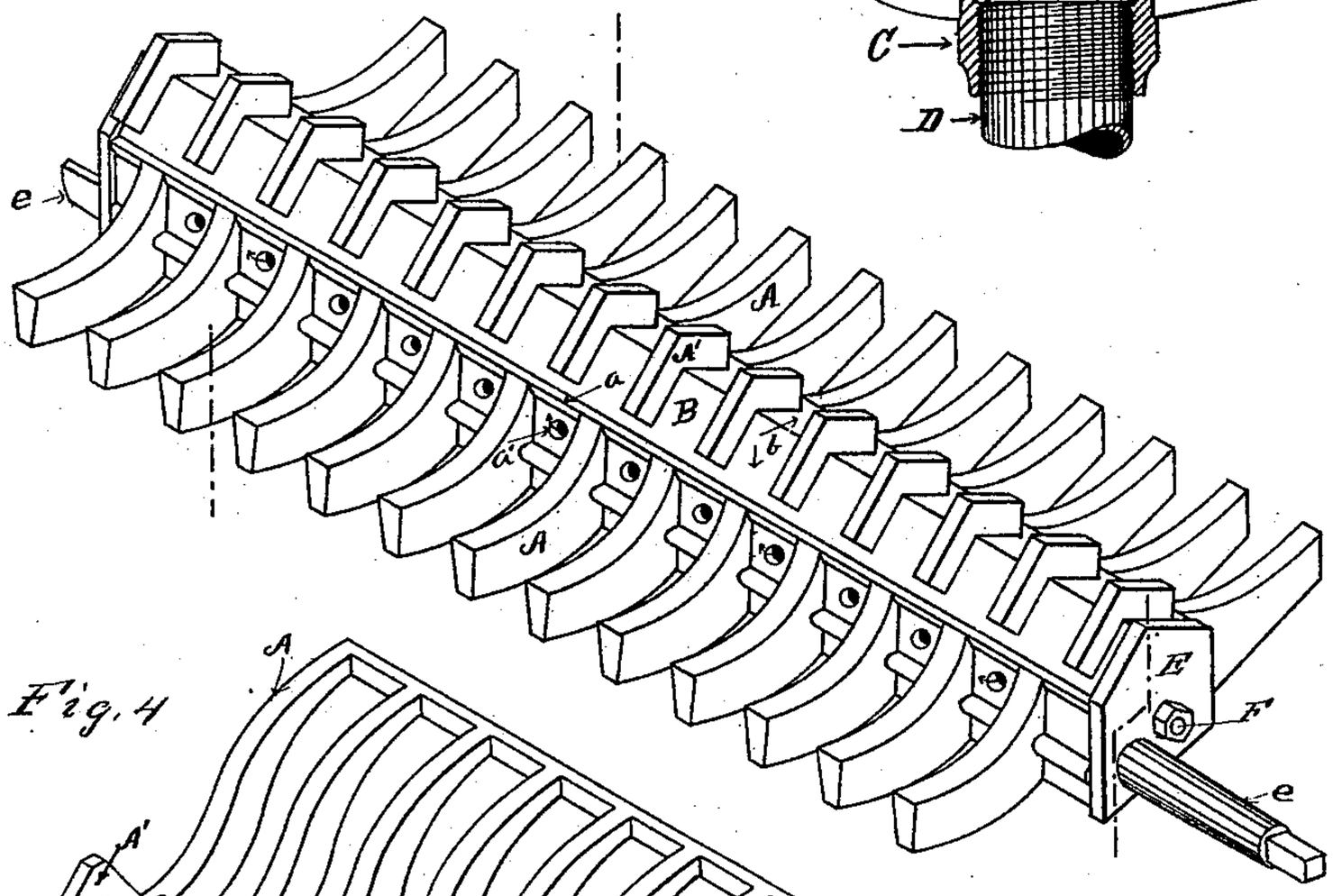
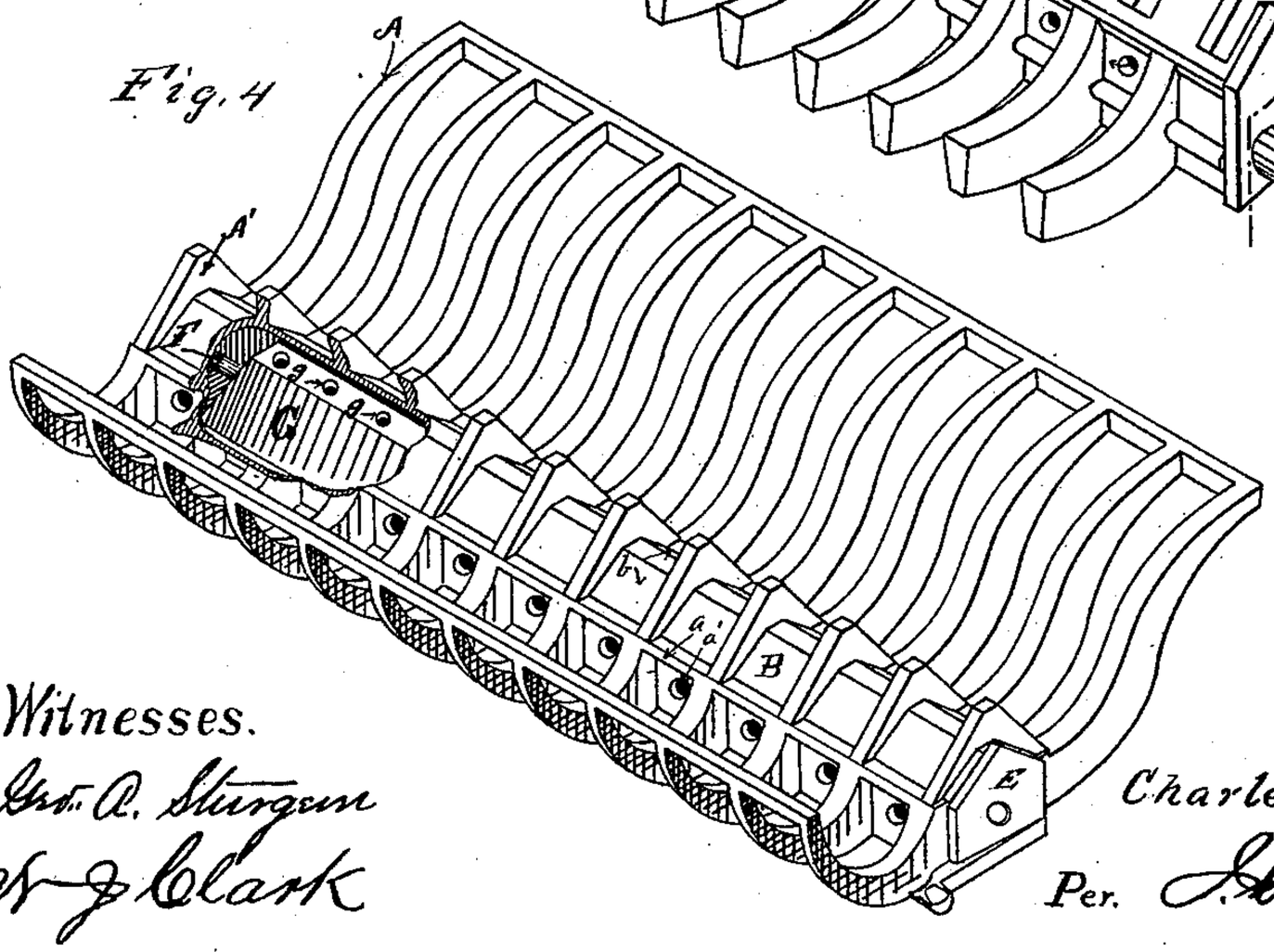


Fig. 4



Witnesses.

Geo. A. Sturgess

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(No Model.) 2 Sheets—Sheet 2.

C. H. MILLER.

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Fig. 6.

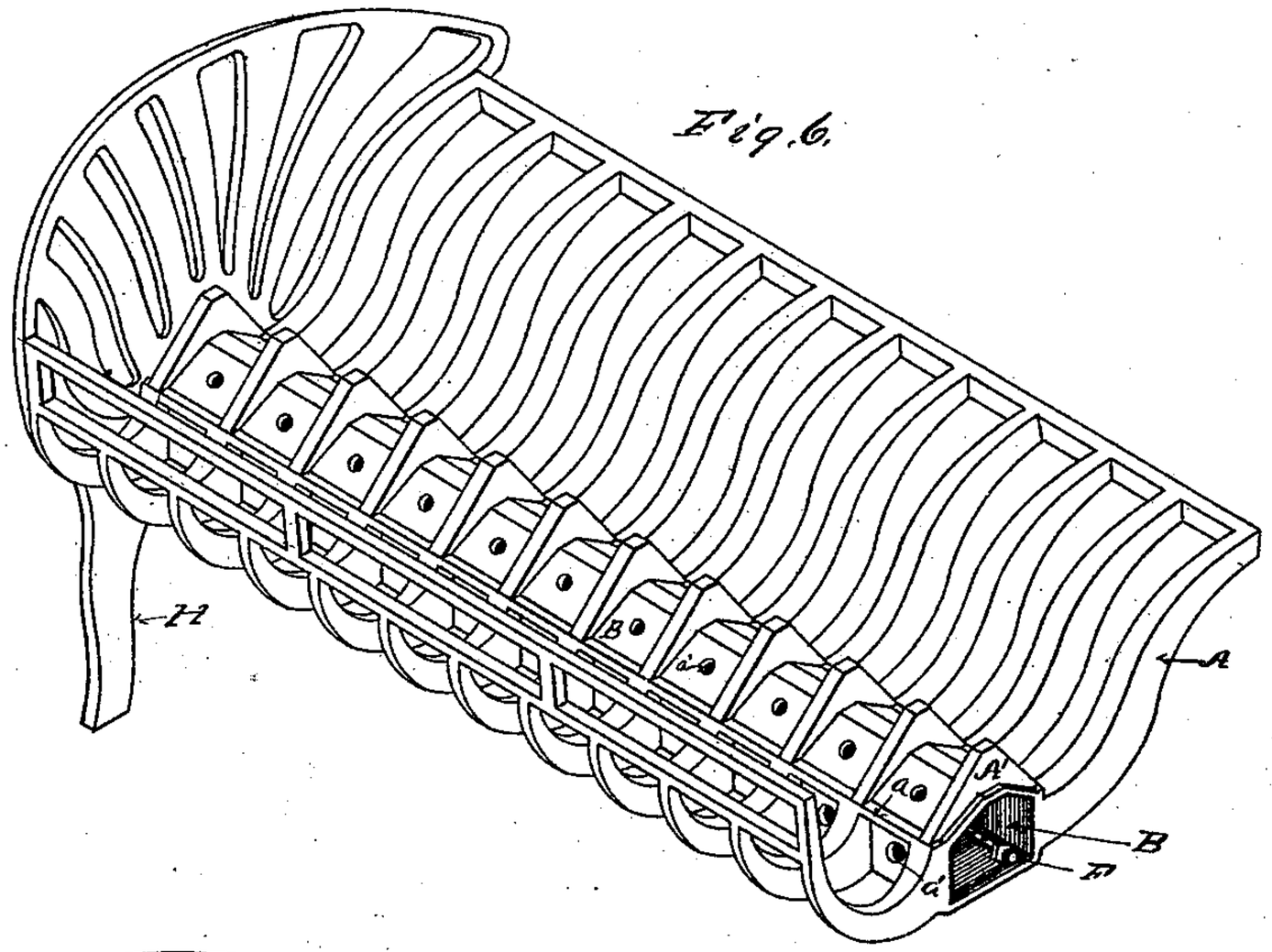
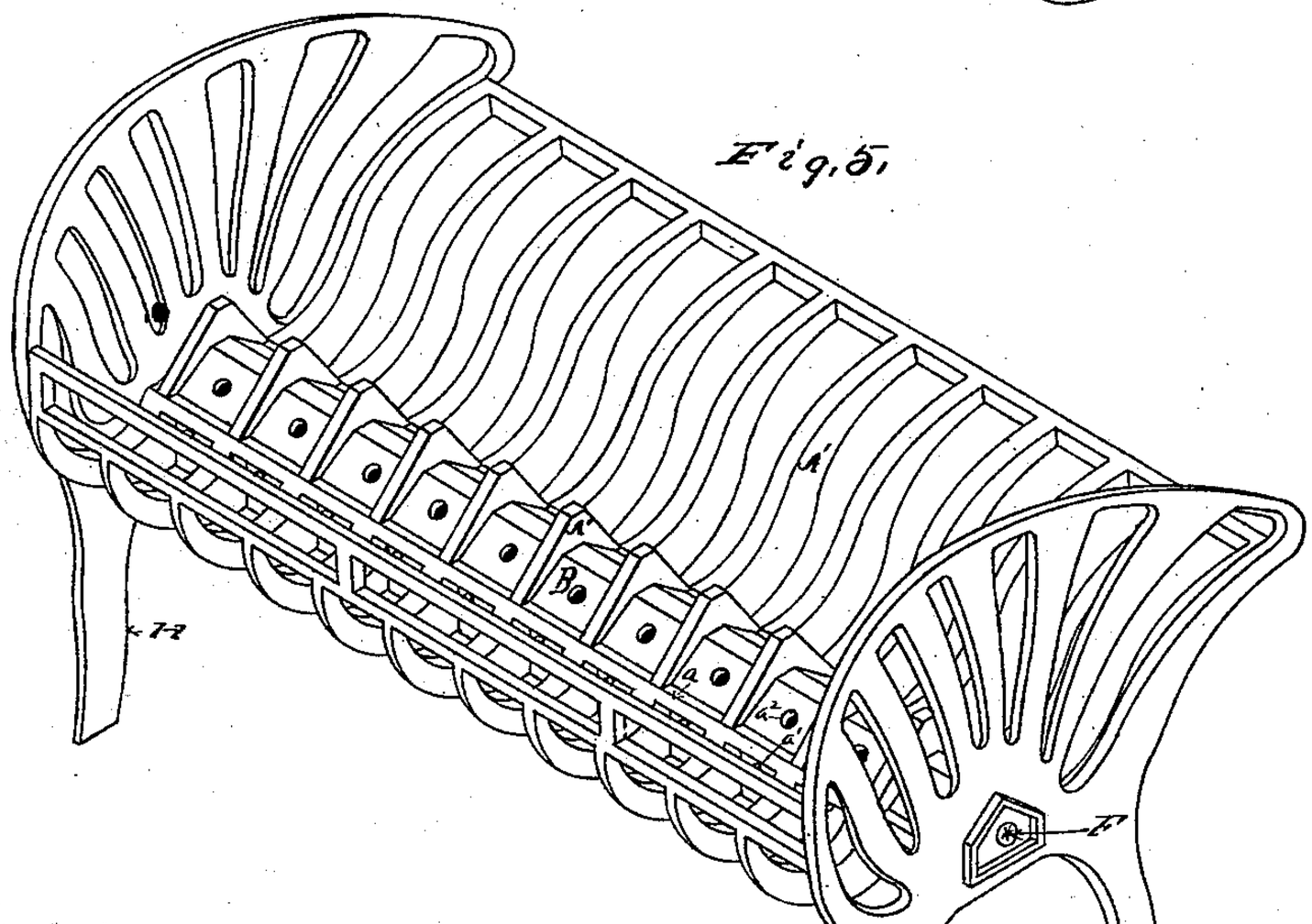


Fig. 5.



Witnesses.
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UNITED STATES PATENT OFFICE.

CHARLES H. MILLER, OF ERIE, PENNSYLVANIA.

COMBINED GAS AND COAL BURNING GRATE.

SPECIFICATION forming part of Letters Patent No. 362,648, dated May 10, 1887.

Application filed December 2, 1886. Serial No. 220,543. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. MILLER, a citizen of the United States, residing at Erie, in the county of Erie and State of Pennsylvania, have invented certain new and useful Improvements in Combined Gas and Coal Burning 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 appertains to make and use the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon, forming part of this specification.

My invention relates to combination gas and coal grates; and it consists in the improvements hereinafter set forth and explained.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a perspective view of one form of my improved grate. Fig. 2 is a central longitudinal vertical section of same. Fig. 3 is a central vertical cross section of same. Fig. 4 is a perspective view of another form of my improved grate. Fig. 5 is a perspective view of a modification of the form of grate shown in Fig. 4. Fig. 6 is a perspective view of the same with one end removed.

Like letters refer to like parts in all the figures.

The objects of my improvement are to construct a grate in such a manner that either gas, coal, or wood may be burned therein with equal facility, or gas and either coal or wood burned at the same time in stoves, grates, or furnaces fitted therewith, without injury to the grate or without any change or adjustment of the burners or grates therein; also, in the construction of a deflector in the gas-distributing chamber of the grate, and also in providing ledges projecting over the gas-discharge openings in such a shape as to prevent dust and ashes from entering therein. To accomplish these objects I construct my improved combined gas and coal grate of bars of suitable length and shape to fit the stove grate or frame to which it is applied, and provide one or more gas passages or chambers, preferably cast as an integral part of the grate, to which the gas-supply pipe is attached, these passages or chambers being provided with small discharge-openings, and preferably with gas deflectors, as hereinafter described.

In Fig. 1 I show a form of grate used by me in cooking stoves and ranges. This grate I construct of the bars A, which are centrally connected together throughout the entire grate by a gas passage or chamber, B, the bars and the chamber B being preferably cast in a single piece, the central part being cored out from end to end in casting, as shown in Figs. 2 and 3. In the central part of the bottom of the chamber B, I provide a thimble, C, in which the gas-supply D is secured. The ends of the chamber B, I close by means of caps E E′, one of which, E′, is provided with a bearing, *e′*, and the other, E, with a bearing, *e*, to which a shaker can be applied to dump the grate when it is not connected with the gas-supply pipe D, these caps E and E′ being held in place by a rod, F, which extends through the chamber B from one cap to the other.

Within the chamber B, I preferably place a gas-deflector, G, constructed with an open bottom and with holes *g* in the top thereof, substantially in the shape shown in Figs. 2 and 3, and also with holes *g′ g′* in the ends thereof to admit the rod F. The holes *g*, it will be observed, are preferably made of small diameter at the central part of the deflector G, and gradually increase in size toward each end thereof, the object of this being to more perfectly distribute the gas toward the ends of the grate. The top *b* of the chamber B, I provide with lugs A′, to keep the coal or other fuel from close contact with the top of the chamber. I preferably make this top *b* highest in the center, from which point it falls at an angle of about forty-five degrees to a point slightly beyond the sides *b′ b′* of the chamber B, so as to form ledges *a a* along the top of and overhanging the sides *b′ b′*. Directly under these ledges *a a*, and between each of the bars A, I bore small gas-discharge openings *a′ a′* on each side of the chamber B, the ledges *a a* preventing dust and ashes from entering therein. I can, however, if desired, make additional discharge-openings in the top *b*.

It will readily be seen that the gas enters the grate through the supply-pipe D, where the deflector G distributes it evenly throughout the entire length of the grate. The gas,

passing from the deflector G through the openings *g*, is brought directly in contact with the inside of the top *b* of the chamber B, where it is superheated by contact therewith, and thence it is deflected downward in its passage, as shown by arrows in Figs. 2 and 3, until it passes out of the openings *a' a'*, when it is consumed.

The grate shown in Fig. 4 is constructed and operates in all respects like that hereinbefore described, except in that the grate-bars A' thereof are constructed of such shape as to adapt this grate for use in an open stove of the "Franklin" type, and those shown in Figs. 5 and 6 are also of like construction and operation, except that they are constructed with legs H and ends I I, of suitable shape to adapt the grate to be placed in and used in an ordinary chimney fire-place by simply taking out the ordinary coal or wood burning devices and putting this grate in its place and connecting the gas-supply pipe thereto.

Having thus fully described my invention, so as to enable others to construct and use the same, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The combination, in a grate adapted to burn gas or coal or other fuel, of the gas-chamber B, having gas-outlets *a' a'* therein, with grate-bars A thereon, lugs A' on the top *b* thereof, and ledges *a a* on the sides thereof, overhanging the gas-openings *a' a'* therein, substantially as and for the purpose set forth.

2. The combination, in a grate adapted to burn gas, coal, or other fuel, of the grate-bars A and the gas chamber or passage B, having the lugs A' on the top *b* thereof and the ledges *a a* on each side thereof, with the gas outlet openings *a' a'*, the gas-deflector G, provided with holes *g*, and the gas-supply pipe D, substantially as and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES H. MILLER.

Witnesses:

GEO. S. STURGEON,

CHAS. C. SHIRK.