

A. C. RAND.

Coal Stove.

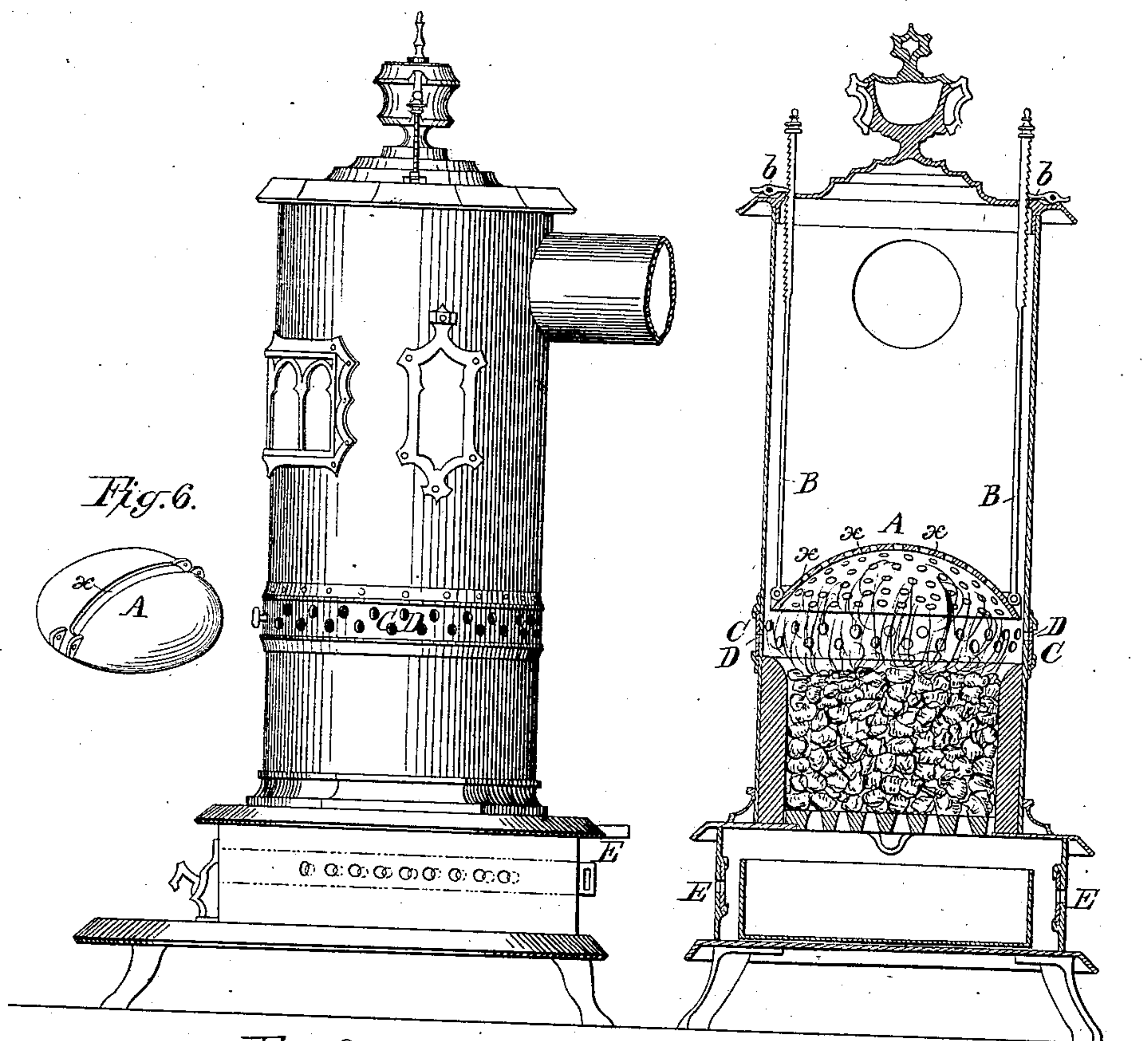
No. 79,390.

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*Fig. 1.*

*Fig. 2.*

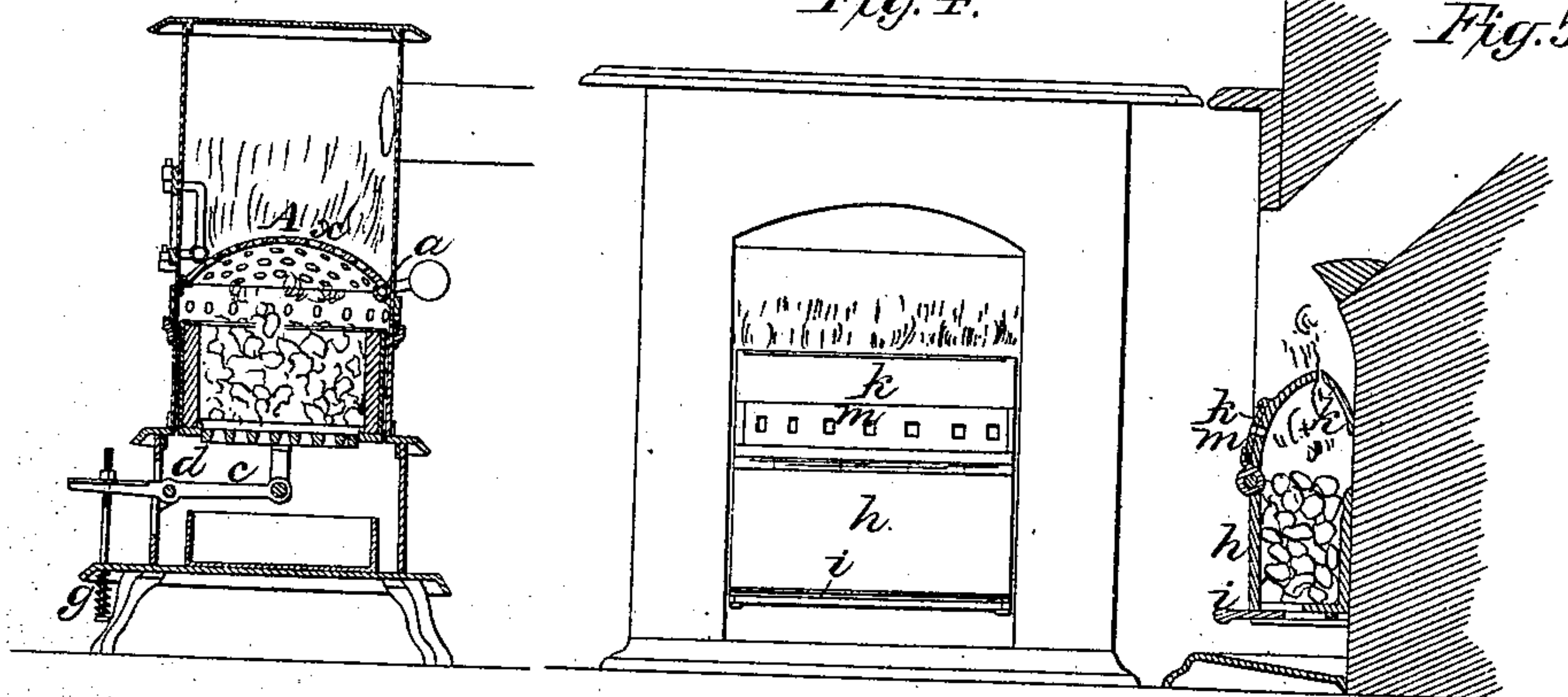
*Fig. 6.*



*Fig. 3.*

*Fig. 4.*

*Fig. 5.*



Witnesses:

*Charles H. Rice*  
*Dr. Barker*

Inventor:

*A. C. Rand*



# United States Patent Office.

ALONZO C. RAND, OF NEW YORK, N. Y.

*Letters Patent No. 79,390, dated June 30, 1868.*

## IMPROVEMENT IN COAL-STOVES.

*The Schedule referred to in these Letters Patent and making part of the same.*

### TO ALL WHOM IT MAY CONCERN:

Be it known that I, ALONZO C. RAND, of the city, county, and State of New York, have invented certain new and useful Improvements in Stoves, Grates, and Furnaces, for heating purposes; and I hereby declare that the following is a full, clear, and exact description thereof.

The object of my invention is to economize fuel, by producing more perfect combustion, and the invention will be found especially advantageous in its adaptation to all furnaces wherein bituminous substances are used. Its principal features are the checking or retarding of combustion, and maintaining only sufficient heat in the fire-box to produce decomposition of the fuel, thereby liberating the gases, and then, before the combustion of the gases takes place, uniting with them a sufficient amount of air to make the combustion perfect.

All who are familiar with the ordinary methods of burning bituminous coals are aware of the fact that a large quantity of unconsumed carbon passes out of the chimney or smoke-stack in black flakes or lamp-black; by the use of my invention this difficulty is entirely overcome.

In the accompanying drawings which form part of this specification—

Figure 1 represents a side elevation of a stove provided with my improvements.

Figure 2, a vertical central section of the same.

Figure 3, a similar section of a stove, in which a modification of the construction of my improvement is employed, for the purpose of making same more self-acting.

Figure 4, a front view of a grate, showing my improvement in the form as adapted for grates.

Figure 5 is a vertical section of the same.

Figure 6 is a modification of the cone used in my improvements.

Similar letters of reference indicate corresponding parts in the several figures.

To enable others skilled in the art to fully comprehend and construct my improvements, I will proceed to describe the construction and operation of the same.

In the drawings, in figs. 1 and 2, my improvements are shown in a stove. It will be seen that the stove may be of ordinary construction, with the exception of the employment of a cone or perforated cap, A, to cover the fire-box. This cone is provided with two rods, B B, to which it is attached, and which project through the cap of the stove, and are provided with notches along their edges, in which small pawls, b b, take hold, so that the cone A is suspended. The rods B B may be raised or lowered at liberty.

The registering-ring C, between the cone A and the top of the fuel in the fire-box, and the casing of the stove, is made with a sufficient and corresponding number of air-passages, D D D D, through it and the casing of the stove, so that all the required amount of air necessary for the complete combustion of the inflammable gases escaping from the top of the fuel is supplied through said passages D D.

In order to provide a more perfect regulation of the supply of air furnished through the ash-pit and fire-grate, I employ a registering-slide, E, on each side of the casing of the ash-pit, and prefer to have no air-passage formed in the front part of the drawer.

When the stove is to be put in operation, the cone A is raised, to admit of throwing the coal in the stove, and the cone, after the fire is lighted, is then lowered towards the coals, so that inflammable gases are, to some extent, retained under the cap A, and are supplied and mixed through the register C with air. The mixed gases and air are finally drawn through the perforations x x of the cone A, and are brought to a most complete combustion by being ignited above the cone. The object in having the cone or deflector adjustable, or else the fire-box adjustable, is that a certain relative distance between the fuel and deflector should be maintained in order to insure perfect combustion above the deflector or cone.

Instead of using a cone, A, with a number of perforations, x x, it is preferable in certain cases to have one or more slots through the same, as shown in fig. 6. Instead of attaching the cone to the rods B B, the same may be hinged, as shown at x in fig. 3, so as to admit of its being raised for charging the fire-box, which may be made self-regulating towards the cone, on the principle of a spring-scale, by making the fire-box so as

to slide freely in the stove up or down, and resting upon the end of a balance-lever, *c*, which has its fulcrum *d* fixed on the side of the ash-pit, and the other end of which projects to the outside of the ash-pit, where it is detained and counterbalanced with a spring, *g*, against the weight of the fuel and fire-box resting upon the other end of the same, so that the fire-box and top surface of the fuel keep always the same relative distance from the cone A over it.

When my improvements are used in grates, I change the construction to the form shown in figs. 4 and 5, in which I provide a rectangular box, *h*, wherein the fuel is placed. The bottom of this box is provided with grate-bars and a registering-slide, *i*, to regulate the supply of air through the grate-bars. To the top part of this box *h*, I hinge the cone *k*, of which the form corresponds with the box *h*, and has, instead of perforations, a longitudinal slot in its top end; it has also a registering-slide, *m*, on its front part, whereby the extra supply of air is furnished and mixed with the gases from the fuel. The grate constructed thus with my improvements, will furnish not only heat, but also light.

The importance of these improvements used in furnaces for soft coals may be clearly seen from the foregoing, and the object attained has been sought for many years.

Having fully described my invention, what I claim therein, and desire to secure by Letters Patent, is—

1. In stoves, grates, or furnaces, the cone A, when used alone, or in combination with the air-passages D D, or an equivalent device or means of retaining, supplying, or mixing air with the inflammable gases before final combustion of the fuel takes place in such stoves, grates, or furnaces, substantially as herein described and for the purposes herein set forth.

2. In combination with the cone A and passages D D, the slide or slides B and E, for regulating the admission of air, the decomposition of the fuel, and consequent production of gas according to the amount of heat required, substantially as herein described.

A. C. RAND.

Witnesses:

R. BOEKLEN,  
CARLOS PIERCE.