

(No Model.)

2 Sheets—Sheet 1.

H. WATERMAN.
STOVE.

No. 377,876.

Patented Feb. 14, 1888.

Fig. 1.

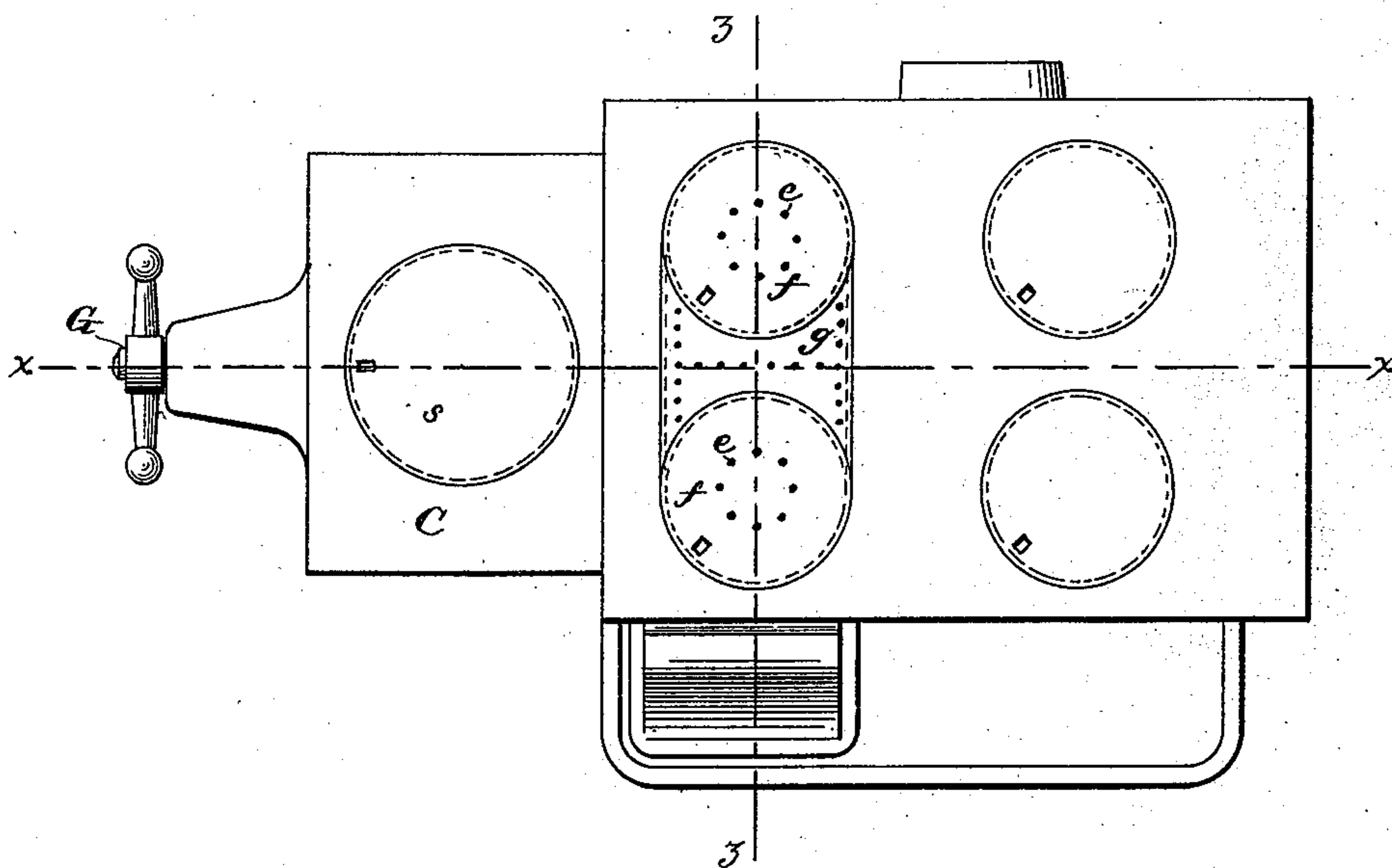
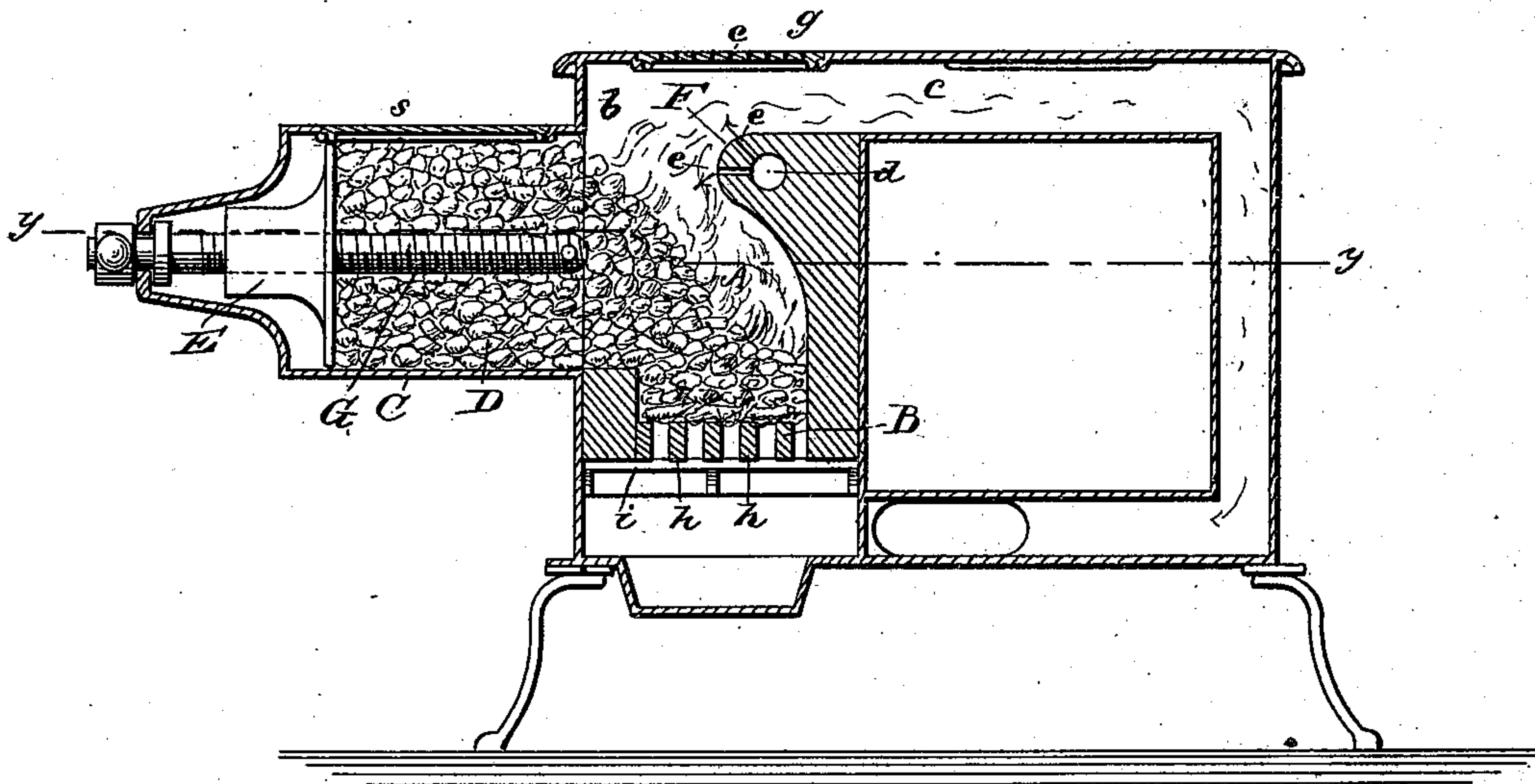


Fig. 2.



WITNESSES:

George Binkenburg
C. Sedgwick

INVENTOR:

H. Waterman

BY

Munir H

ATTORNEYS.

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Fig. 3.

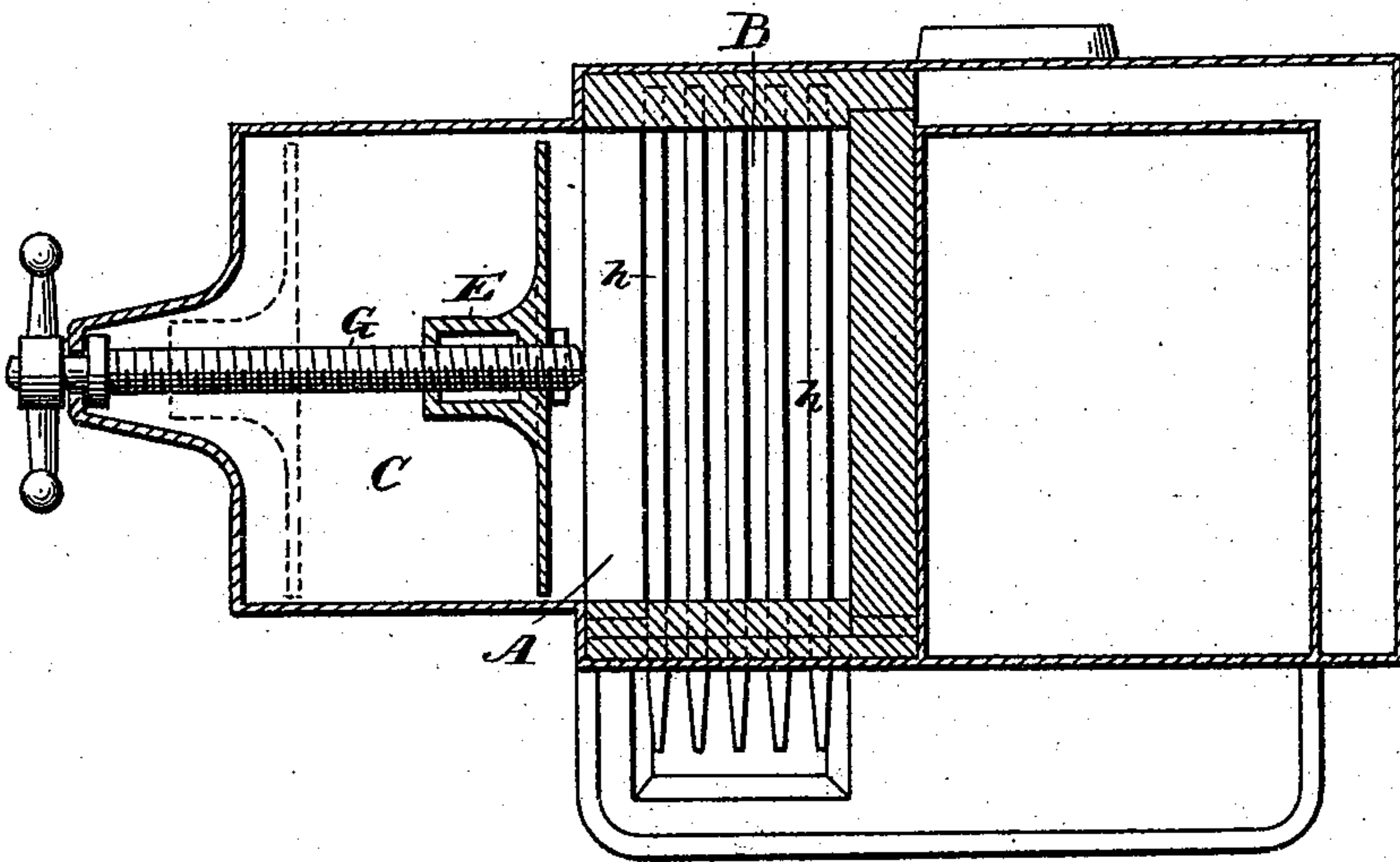
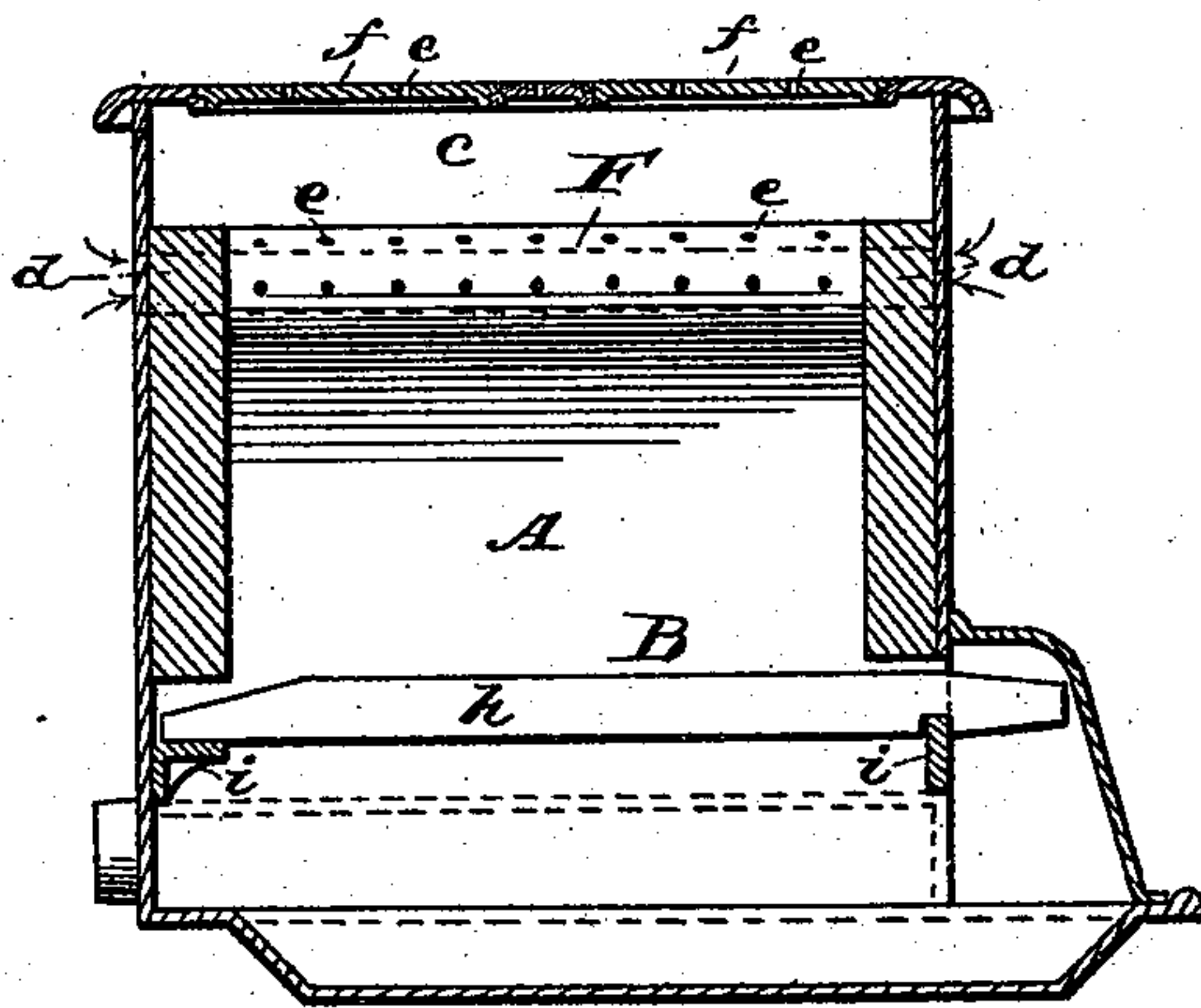


Fig. 4.



WITNESSES:

George Binkenberg,
Coedgwick.

INVENTOR:

H. Waterman.

BY

Munn & Co.

ATTORNEYS.

UNITED STATES PATENT OFFICE.

HENRY WATERMAN, OF BROOKLYN, NEW YORK, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO HIMSELF, JOHN G. F. METCALF, AND EDWARD R. COKER, ALL OF SAME PLACE.

STOVE.

SPECIFICATION forming part of Letters Patent No. 377,876, dated February 14, 1888.

Application filed February 24, 1887. Serial No. 228,700. (No model.)

To all whom it may concern:

Be it known that I, HENRY WATERMAN, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Stoves, of which the following is a full, clear, and exact description.

This invention relates to stoves for burning bituminous coal as fuel, and its leading object is to produce a more perfect and economical combustion of such fuel free from much or any escape of smoke.

The invention consists in the construction and arrangement of parts, as will be hereinafter fully described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 represents a plan view of a stove embodying my invention; Fig. 2, a vertical section of the same upon the line *x x* in Fig. 1; Fig. 3, a horizontal section thereof upon the line *y y* in Fig. 2, and Fig. 4 a transverse section upon the line *z z* in Fig. 1.

A is the fire-chamber or furnace of the stove, and B its grate. Said chamber is lined on three of its sides with fire-brick, but only for a short distance of its height on the remaining side, where it is open above the grate to establish communication with an attached horizontal or approximately-horizontal chamber, C, closed on its sides, but open wholly on its inner end to the furnace. This chamber C may either be of cylindrical or any other suitable shape in transverse section, and forms a receptacle for the coal to be fed to the furnace and to be treated by the flame and heated gases of the incandescent fuel on the grate. It is provided with an opening in its top, closed by a cover, s, for charging it with the coal, D. It is also fitted with a piston or plunger, E, in front of which the coal is placed, and which serves, as the piston or follower is moved forward, to supply the burning fuel on the grate with fresh coal.

The side of the furnace opposite this chamber C has an upper inner projecting breast, F, of brick, to form, in connection with the opposite side of the fire-chamber, a throat, b, for the purpose of concentrating the heat where the smoke and gases are burned in their at-

tempt to escape by a flue, c, to the outlet from the stove. This breast has a duct, d, within it to admit fresh air through apertures e, and, if desired, the top of the stove over the fire—as, for instance, the covers f and bridge g when the stove is a cooking one, as shown—may also have fresh-air inlets e, all or any of them, for the purpose of admitting oxygen to burn the escaping gases or to assist in burning them. The breast F and throat b also serve to concentrate the heat on the bank of coal, D, formed by the exposure and feed of it from the inner end of the chamber C, to secure the desired action of the flame and heated gases upon such exposed green or fresh coal.

The follower E is moved backward or forward to charge the chamber C with coal or to feed coal into the fire-chamber by a screw, G, having a collared bearing in the outer end of the chamber; or a lever or rack and pinion or any other suitable mechanism may be used to move the follower. When charging the chamber C with coal, however, care should be taken to draw the follower back, so as not to let the coal in rear of it. Said follower is adjusted forward at intervals to feed the coal to the furnace as required.

The grate B, I prefer to make up of separate longitudinal bars h, resting on suitable cross-bars, i, and projecting out through the front of the stove, so that they may be independently drawn out to pass clinkers and ashes into the ash-pit, said bars being constructed on their forward-projecting ends to receive a handle for the purpose of moving them in or out with facility. Said grate, however, may be otherwise constructed, if desired.

The operation is as follows: Kindling-wood is placed upon the grate B and the follower E drawn back to the extreme outer end of the magazine or chamber C. Said chamber is then half-filled (more or less) with coal and the follower E then moved forward until sufficient coal is discharged from said chamber to cover the wood to the extent of a thin layer. The fire is then lighted. After the coal covering the wood has become well lighted, the follower E is moved forward a short distance, which will add a little more coal to the fire. When this second supply of coal has become ignited, the

follower E is moved back and the chamber C
 filled with coal, the largest lumps of which are
 preferably placed at the bottom. After this
 the follower is not moved forward again to
 5 feed the coal to the furnace until the ignited
 coal has settled down and forms only a thin
 layer over the grate, when the follower should
 be moved forward a short distance only, so as
 to keep but a small or low fire on the grate.
 10 Using these precautions, a bank of coal will
 be formed on one side of the fire-chamber ex-
 tending down from and in front of the inner
 open end of the chamber C. This bank of
 coal thus presented to the hot fire will be
 15 dried, roasted, caked, become friable and be
 partly coked, and be constantly disengaging
 from it the vapors of water, sulphur, fine par-
 ticles of carbon in the form of smoke, and hy-
 drogen and other gases, all of which, with the
 20 exception of the vapor of water, will be burned
 as they pass over the hot fire and through the
 throat *b*. Simultaneously with this, small por-
 tions of the friable coal, as the bitumen burns
 out, will be continually dropping onto the in-
 25 candescent coal and become quickly ignited
 and keeping up a hot fire continuously with
 little or no smoke. This mode of burning the
 coal essentially differs from shoveling fresh
 coal onto hot coal in the furnace, which cools
 30 the fire to such an extent that the fine parti-
 cles of carbon, sulphur, and the eliminated
 gases pass off without being burned, thus pro-
 ducing clouds of smoke and wasting a large
 portion of the combustible elements of fuel
 35 that usually, as the same escape, are deposited
 in the form of soot in or about the stove, its
 flues, chimney, or elsewhere. By my plan or
 construction the fresh coal does not come in
 contact with the ignited coal till it is gradu-
 40 ally heated up to near the igniting-point, and
 its smoke-producing properties are vaporized

and consumed in the hottest part of the fur-
 nace and throat at top of the furnace. The
 incandescent fuel is not cooled by the intro-
 duction of fresh coal, and a high temperature 45
 is maintained that will consume the smoke and
 all the inflammable vapors or gases as fast as
 they are eliminated.

I am aware that prior to my invention feed-
 ing-troughs open at the top and both ends 50
 have been used in connection with puddling-
 furnaces and steam-boiler furnaces; also, that
 feeding-cylinders closed at both ends, but hav-
 ing a discharge-opening beneath and provided
 with a piston or plunger, have been used; like- 55
 wise feeding-spouts to stoves, arranged to pass
 the coal from beneath; but none of these, nor
 yet any of the magazine-stoves in use, do I
 claim.

The invention may be applied to various 60
 kinds of cooking and other stoves.

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

The fire-chamber A of the stove, provided 65
 on its one side with a horizontal hollow in-
 wardly-projecting upper breast, F, having a
 longitudinal aperture, *d*, leading through the
 sides of the stove, and transverse air outlets
 or perforations *e*, in combination with the 70
 grate B, the externally-projecting feeding-
 chamber C, having an open inner end and ar-
 ranged on the opposite side of the fire-cham-
 ber to the breast F, the follower E within
 said feeding-chamber, and means for operat- 75
 ing said follower, substantially as and for the
 purposes specified.

HENRY WATERMAN.

Witnesses:

A. GREGORY,
 C. SEDGWICK.