

(No Model.)

J. ADAMS.
HYDROCARBON BURNER.

No. 427,820.

Patented May 13, 1890.

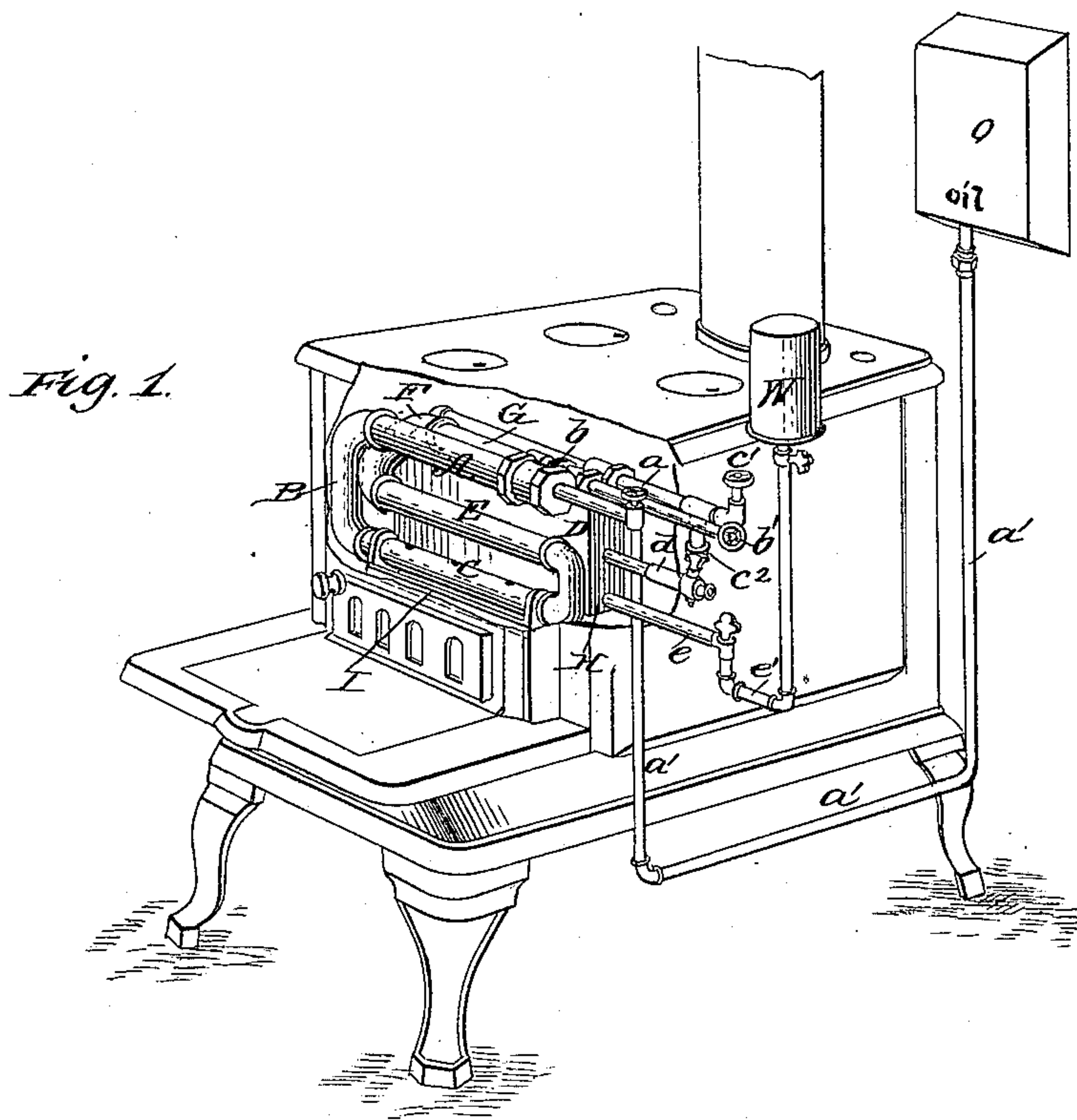
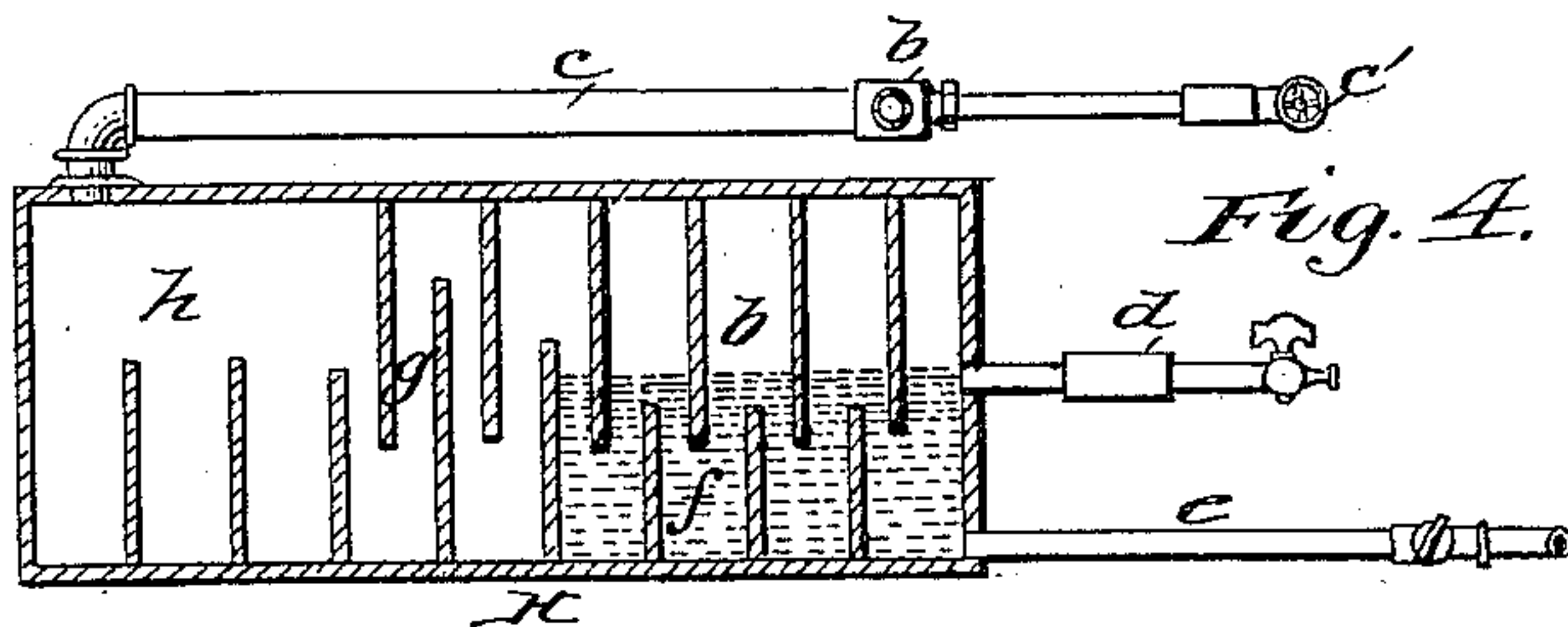
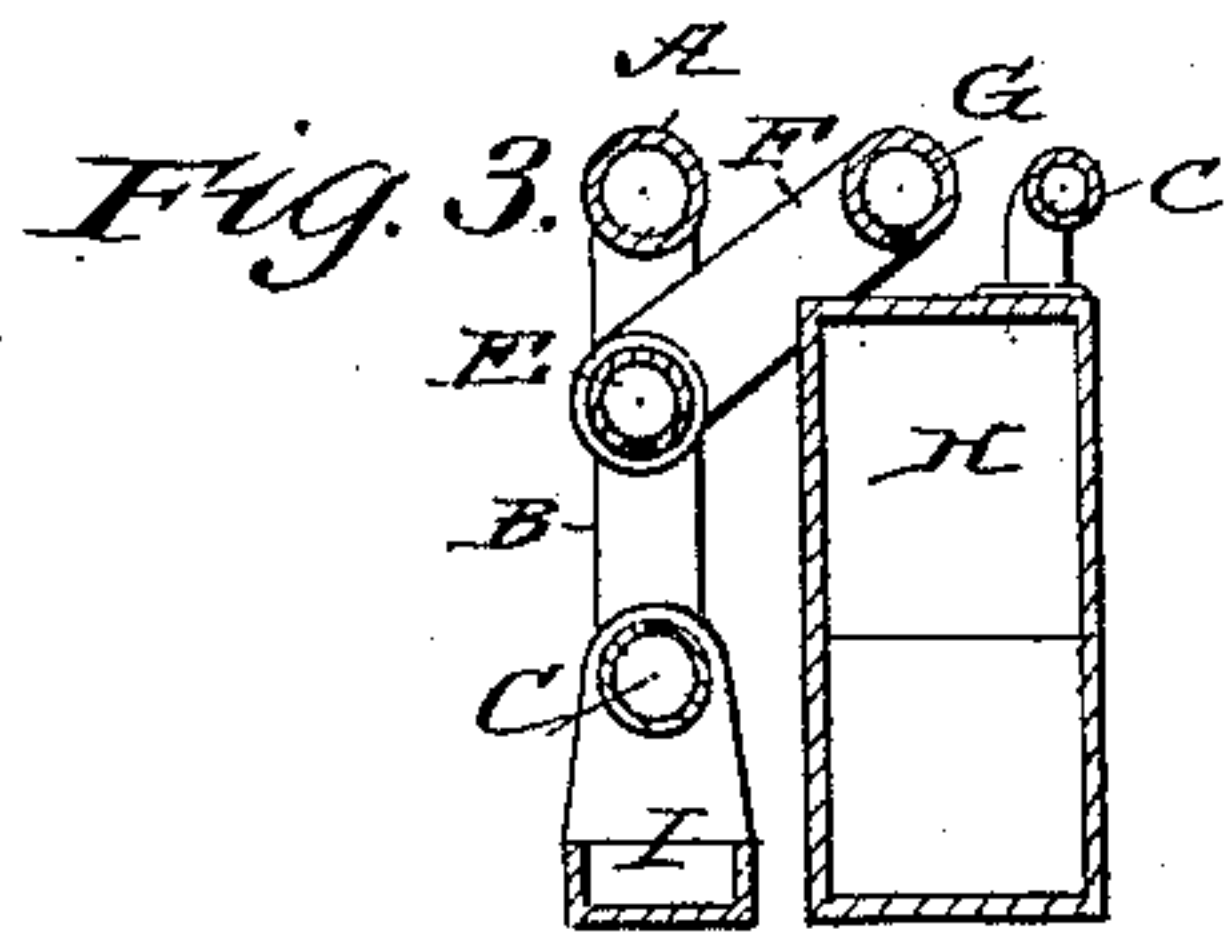
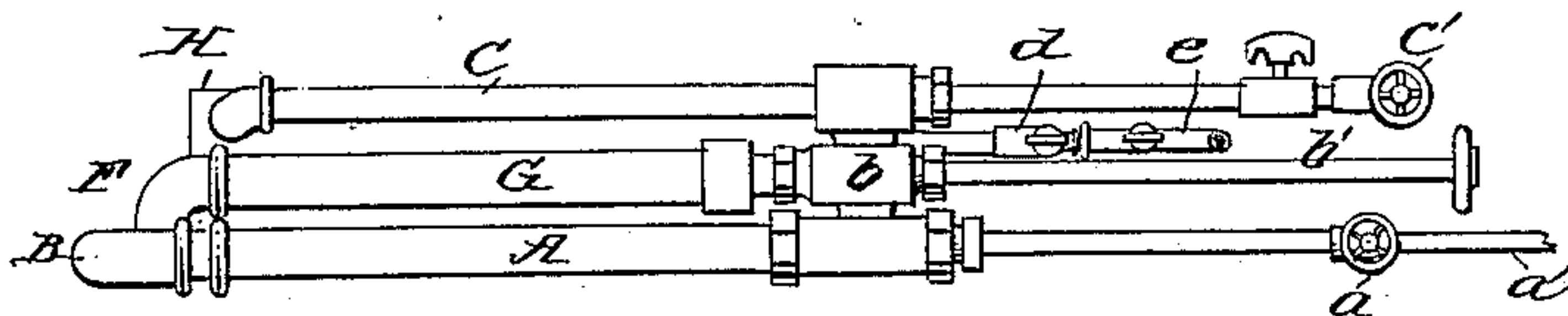


Fig. 2.



WITNESSES:

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JOHN ADAMS, OF NASHVILLE, TENNESSEE.

HYDROCARBON-BURNER.

SPECIFICATION forming part of Letters Patent No. 427,820, dated May 13, 1890.

Application filed November 30, 1888. Renewed November 11, 1889. Serial No. 329,833. (No model.)

To all whom it may concern:

Be it known that I, JOHN ADAMS, of Nashville, in the county of Davidson and State of Tennessee, have invented a new and useful
5 Improvement in Hydrocarbon-Burners, of which the following is a specification.

My invention is in the nature of an improved hydrocarbon-burner designed especially for use in cooking-stoves and adapted
10 to burn a mixture of petroleum or other liquid hydrocarbon and steam; and it consists in the peculiar construction and arrangement of the parts of the burner, as will be hereinafter fully described.

15 Figure 1 is a perspective view of a cooking-stove with the front part broken away to show my burner in the fire-box. Fig. 2 is a top plan view of the burner removed from the stove. Fig. 3 is a vertical cross-section of
20 the same, and Fig. 4 is a vertical longitudinal section through the steam-generator.

In the drawings, O is an oil-reservoir, which is located a short distance above the burner and connects with it by a pipe *a'* and a valve
25 *a*. The pipe *a'* is trapped between the reservoir and the burner by being carried down to near the floor from the reservoir, and then rises to the burner. The object of this is to keep a body of oil in the pipe *a'* after the oil
30 in the reservoir has been exhausted, and thus prevent the flames from striking back explosively into the gases left in the reservoir.

W is the water-reservoir. This communicates with the steam-generator H of the
35 burner through pipe *e*, which enters the steam-generator at the bottom. This pipe *e* has a valve and also a trap *e'* in the same.

The burner consists of two principal parts—
i. e., the oil volatilizing and mixing coils A B
40 C D E F G, and a steam-generator H, arranged parallel therewith and side by side. The generator is constructed in the form of a flat rectangular box, having a series of partitions *f g*
45 *h* in the same, (see Fig. 4,) one series of which rise from the bottom and the other series of which depend from the top between the bottom partitions, forming, when water is admitted to the box, a series of trapped chambers, which prevent the back-pressure of steam from
50 forcing its way to the water-reservoir. About the middle line of the steam-generator there is inserted a gage-cock *d*, which is used to de-

termine the water-level in the steam-generator. In the portion *f* of the generator the water is contained, in the part *g* the steam is
55 generated, and in the part *h*, which has no upper partitions, the steam is superheated, the jets of flame from the burner being so disposed or directed upon the box H as to secure this result. From the upper portion of
60 the superheated-steam chamber *h* there emerges the steam-pipe *c*, which carries steam to a valve *b*, by which it is admitted to the tube A of the burner, a stem *b'* projecting
65 outside of the stove-casing and provided with a hand-wheel for the operation of said valve. At the end of the steam-pipe *c* where it joins the valve *b* there is a pipe having a safety-
70 valve *c'* and a drip-cock *c''*. The object of the safety-valve is to give relief to any excessive steam-pressure, while the drip-cock allows condensed steam to be blown out.

The upper tube A of the burner receives the oil from pipe *a'* and valve *a*, and at the valve *b* also receives steam, which, becoming
75 mixed with the oil, passes on to the elbows and tubes B C D E F G of the burner, in which the oil becomes volatilized.

The tubes C, E, and G are perforated with holes to allow the volatilized oil and steam to
80 escape in jets, forming a gaseous mixture, which burns with an active combustion and intense heat. To the tube C there is hung a trough or pan I, which serves to hold a small
85 quantity of oil which is poured in the same and ignited in starting the burner. This pan also serves to catch any drip of oil that may escape from the outlet-holes for the jets. The
90 tubes C, E, and G are each provided with perforations or jet-holes, through which the vapor under pressure issues and burns, the jets being
95 so arranged in number and direction as to heat the burner-tubes, and thus volatilize the oil and also heat the steam-generator, and thus cause a sufficient generation and admixture of steam.

In order that the function and value of the steam-generator with partitions or baffle-plates may be better understood, I will state
100 that the series of hydraulic seals formed by the upper plates depending between the lower ones serve to prevent the back-pressure through the feed-pipe *c*, and this enables me to get a higher degree of heat and pressure

in the superheated steam, and this, by obvi-
ating its dampness and increasing its tension,
promotes a more active combustion, free from
all deposits of lamp-black. As the water in
5 the partitions at *f* boils, the pressure of steam
above forces the water-level down and throws
the water and steam over into the chambers
at *g*, which chambers complete the evapora-
tion of the water, while the hot chamber *h*
10 serves to thoroughly dry and superheat it.

Having thus described my invention, what
I claim as new is—

1. In a hydrocarbon-burner, the steam gen-
erating and superheating box having a series
15 of partitions at the bottom and a second se-
ries depending from the top between those of
the lower series, in combination with a perfo-
rated burner-coil arranged beside the steam-
generating box, a valve connecting the steam-

generator and the burner-coil, and the oil- 20
supply pipe, substantially as shown and de-
scribed.

2. In a hydrocarbon-burner, the steam gen-
erating and superheating box having a series
of partitions at the bottom and a second se- 25
ries depending from the top between those of
the lower series, and a water-inlet and steam-
outlet, as described, in combination with the
perforated burner-coils arranged beside the
steam-generator, a valve connecting the steam- 30
outlet with the burner-coil, the oil-supply pipe
leading into the upper part of the burner-coil,
and a trough located beneath the burner-coil,
substantially as shown and described.

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Witnesses:

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