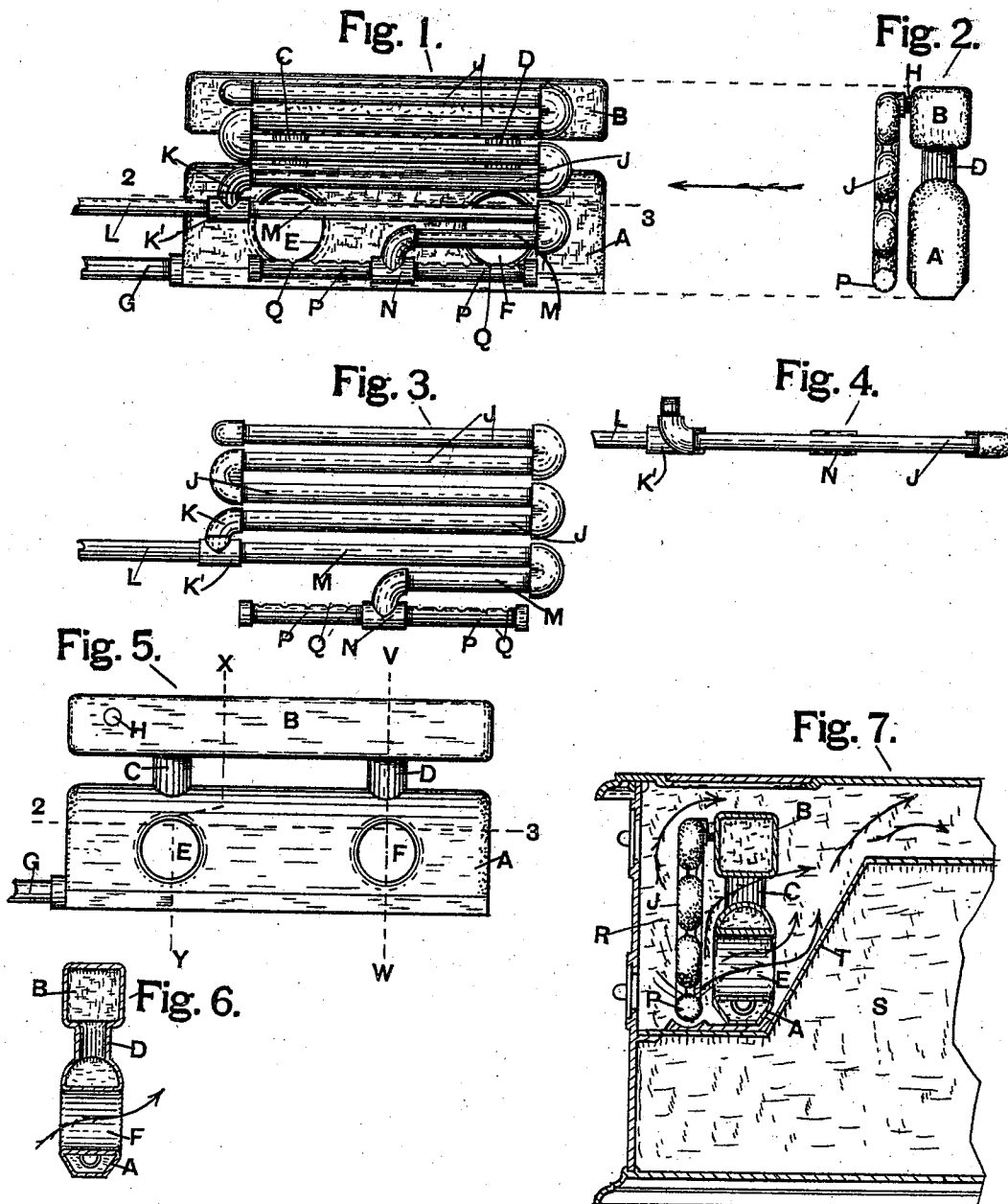


(No Model.)

C. BRUCE.
VAPOR BURNER.

No. 502,029.

Patented July 25, 1893.



WITNESSES:

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James Milnes

INVENTOR:

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UNITED STATES PATENT OFFICE.

CLARK BRUCE, OF CHICAGO, ILLINOIS.

VAPOR-BURNER.

SPECIFICATION forming part of Letters Patent No. 502,029, dated July 25, 1893.

Application filed February 23, 1893. Serial No. 463,301. (No model.)

To all whom it may concern:

Be it known that I, CLARK BRUCE, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a new and useful Vapor-Burner, of which the following is a specification.

My invention relates to vapor burners and my object is to provide a construction and combination of parts which comprise a burner of this character which is particularly adapted to use in an ordinary cooking stove, all of which is hereinafter described and is illustrated by the accompanying drawings, in which—

Figure 1 is a front elevation of the heater as it appears when detached from the stove. Fig. 2 is an end elevation of Fig. 1, viewed in direction indicated by the arrow. Fig. 3 is a front elevation of a series of pipes into which steam and oil are admitted to form the vapor which is burned, as will be described hereinafter, Fig. 3 being a detached portion of Fig. 1. Fig. 4 is a plan view of Fig. 3. Fig. 5 is a front elevation of the steam boiler shown in Fig. 1. Fig. 6 is a transverse section of Fig. 5 on line V W, and Fig. 7 is a vertical section of the front half of a common cooking stove, showing the fire back which forms a portion of the front wall of the oven, and also the top of the oven, with the heater in the proper position for duty, the heater boiler being shown in vertical cross section on line X Y, Fig. 5.

Similar letters refer to like parts throughout the several views.

A is the main portion of the boiler, which is provided with a steam superheater B which is connected to the portion A by means of pipes C and D, and at E and F are flues which pass transversely from front to back through the main portion A, as shown.

At G is a pipe through which water is supplied to the boiler, and at H, Fig. 5, is an orifice into which is connected the top portion of another superheater comprising a series of pipes J, and their connections, which receive steam from superheater B. The steam superheater pipes terminate at the elbow K where is connected an ordinary T connection K'. At one end of the T is connected the pipe L through which oil is admitted to the T K' where it is met by the superheated steam from

the boiler. Pipes M and their connections connect T K' with T N from which, right and left, are pipes P which are capped at the outer end and are perforated at the upper side at Q, as shown.

The vapor burner when in position for duty takes a relative place in a cooking stove similar to what is shown in Fig. 7, in which R is the usual furnace apartment of a cooking stove, and S the oven whose front upper wall is the fire back T, which is in close proximity to the rear side of the boiler A.

In ordinary vapor burners of this character there are two objections to their introduction for use in cooking stoves, which are as follows: In the introduction of the oil to the steam superheating portion of these devices the point of entrance to the superheater is too high, causing the oil to flow over into the boiler and cover the surface of the water, and afterward interfere with the regularity of the working of the apparatus on account of the tendency of the water in the boiler to foam, the action of the steam intermittently carrying both oil and water over into the superheater pipes, which when very hot cause the water and oil to suddenly explode into vapor and extinguish the flame at the burner orifices. Another objection to the common form of vapor burner of this character is that when the boiler is of sufficient capacity to supply steam for the purpose, and of the form hereinbefore described, it becomes a baffle against the passage of the heated gases of combustion contacting the rear wall of the furnace portion of the stove, which wall being also the wall of the oven the heat is very unevenly distributed to the oven with the result that the most desirable effects are not produced. To obviate these objections I introduce oil into the lower pipe of a series of superheater pipes at about the level of the surface of the water in the boiler in which, as is obvious from what is shown in the drawings, the oil can never run over into the boiler; and then, by placing the flues E and F directly under the connecting pipes C and D the steam arising from the surface of the water, which is never higher than the dotted line 2—3 in boiler A, must pass the hot top portion of these flues before entering the superheater pipes C and D, which effectually pre-

vents the passage of very wet steam into the superheater B. It is obvious that the flame from the burning vapor at the holes Q of pipes P will pass in part directly rearward through flues E and F, and upward between the top of boiler A and its superheater B; part of the heat rising and contacting with pipes J, thence passing over the top of and in contact with superheater B, thence onward through between the plates which form the tops of the stove and the oven thereof, as indicated by the arrows in Fig. 7; the heat from the flame at pipes P being spread out over the comparatively large surface of the superheater portion of the apparatus, and not concentrated upon any small surface thereof, to cause burning out, as is commonly the case in vapor burners of this class. The fire back T, because of flues E and F, imparts to oven S its share of heat by the contact of the flames which pass rearward through the flues, the upper portion of the oven receiving heat from the current of waste gases as usual.

I claim as my invention—

1. A vapor burner consisting of two portions arranged side by side and joined together at the top, one of the portions comprising two sections the lower one of which has a water supply pipe and forms a boiler and is provided with transverse passages or openings, and the upper section forming a super-heater, said sections being joined together by vertical

tubes, one above each of said openings, and the other portion comprising a series of pipes or tubes arranged one above the other, and communicating at one end with the superheater of the other portion of the burner, and having its opposite end terminating in a closed ended burner the upper side of which is perforated, and an oil supply pipe communicating with said second mentioned section at a point substantially even with the level of the water in the boiler substantially as set forth.

2. The combination, with a cooking stove, the upper portion of the front wall of the oven of which stove is the fire wall of the furnace apartment, of a vapor burner located in the furnace apartment in close proximity to the fire wall, said burner comprising two portions, the front one of which is provided with the burner and the rear portion is provided with transverse openings or passages whereby the heat from the burner in front may pass through the rear portion and strike directly against the fire wall and heat the oven uniformly, substantially as set forth.

In testimony that I claim the foregoing I have hereunto set my hand, this 6th day of February, 1893, in the presence of witnesses.

CLARK BRUCE.

Witnesses:

A. J. BARNETT,
J. D. BRYANT.