C. B. LOVELESS.

Petroleum Stove.

No. 42,007.

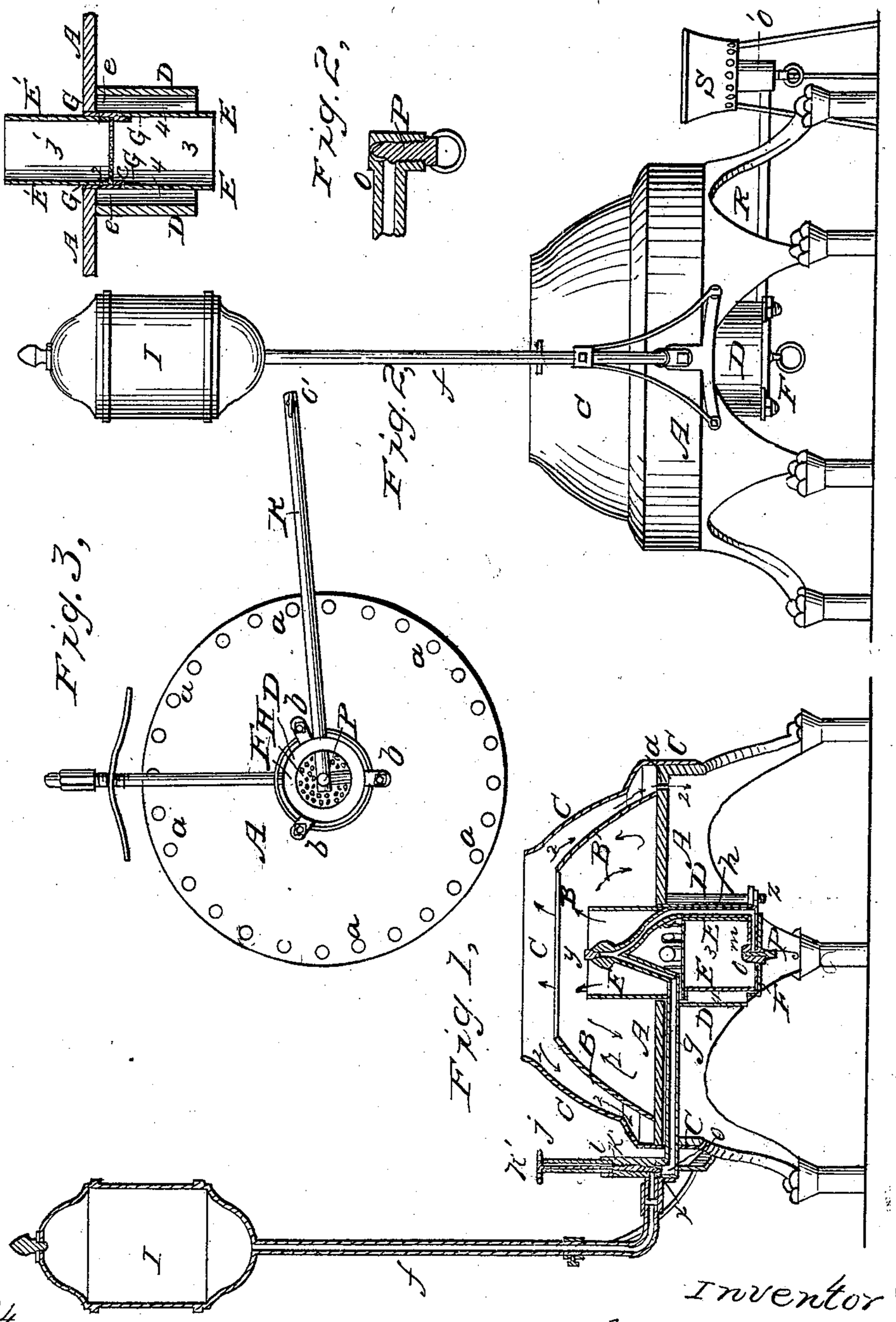
Patented March 22, 1864.

Fig. 4.

Fig. 2,

Fig. 3,

Fig. 1,



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UNITED STATES PATENT OFFICE.

CHARLES B. LOVELESS, OF SYRACUSE, NEW YORK.

IMPROVEMENT IN PETROLEUM-STOVE.

Specification forming part of Letters Patent No. **42,007,** dated March 22, 1864.

To all whom it may concern:

Be it known that I, CHARLES B. LOVELESS, of Syracuse, in the county of Onondaga, and in the State of New York, have invented certain new and useful Improvements in Vapor-Stoves; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference thereon marked.

In the drawings, Figure 1 is a vertical section. Fig. 2 is a side elevation. Fig. 3 is a plan of the bottom of stove. Fig. 4 is a section showing the double air-mixing chamber. Fig. 5 is an enlarged view showing the valve for regulating the flow of the gas or vapor.

To enable those skilled in the art to make and use my invention, I will describe its construction and operation.

The nature of my invention consists in such an improved construction of "vapor-stoves" designed to use the vapor generated from naphtha, coal-oil, petroleum, or other fluid as to enable me to produce an apparatus safer, cheaper, more simple and effective, and more easily kept in order than in any other apparatus heretofore known, as will hereinafter appear.

A is the cast-iron tablet or stove-base, provided with a suitable number of legs, so as to raise it some twelve or fifteen inches above the floor, the diameter of this circular disk being about sixteen inches. Around the outer edge of this plate are escape-holes *a*, through which the spent heat and products of combustion escape after performing their function. It will be understood that the vapor works under the pressure of a head, and that the tendency of the heated air is to rise. As it rises it comes into contact with the culinary vessel, becomes partially cooled, and is forced out of the way by a new supply of heated air, and falls down and escapes through holes *a*, under the bottom of the stove-plate A.

B is a sheet-metal deflector, formed in a semispherical form, and resting upon the stove-plate A just within the line of escape-holes. There is an opening of suitable size in the top of this deflector. The object of this partition or deflector is to form a hot-air chamber, 1, above the base-plate and immediately around the aero-burner and under the culinary vessel, and also to form a contracted passage between its outer surface and the outer casing or top for the escape of the products of combustion.

C is the outer casing or stove-top, of cast-iron, of a general form, somewhat semispherical, and made so as to fit down over and around the base-plate A closely, so as to need no fitting or fastening, being kept in place by its own gravity. There is a suitable opening in the top of this casing for the reception of cooking-vessels. There are also provided a suitable number of plates, such as are in common use for closing the top pot-holes of cooking-stoves. Between the inside surface of this casing C and the outside surface of the deflector B is an escape-chamber, 2.

One of the most important features in my invention is the double air-mixing chamber 3, which I will now describe.

D is the outer cylinder. (See Fig. 4.)

E is the inner cylinder, which is concentrically within cylinder D, and somewhat removed from it, leaving an annular chamber, 4, between the two cylinders D and E. These two cylinders are secured to the under side and center of the base-plate A by means of a supporting-cap, F, and three rods, *b*, riveted to the base-plate and extending below it and through cap F, and are provided with nuts.

G is a short cylinder, like the inner cylinder, E, about three inches in diameter, and is provided with a narrow internal rim or flange, *c*, at the bottom. Its top is flush with the top of the base-plate, while its bottom extends about half an inch below the botton of the base-plate, and fits into and upon the top of the inner cylinder, E. Upon this flange *c* there rests a perforated plate, H, through which the vapor passes and ignites.

E′ is a continuation of the inner cylinder E, and rests upon the perforated plate. This cylinder E′ is about four or five inches high, and contains the flame produced by the ignition of the mixture of vapor and air, and serves to confine the greatest heat immediately around the retort.

e are the air-holes through cylinders G and E′, just below the base-plate A, and through which air heated by its passage between cylinders D and E passes into the chamber or cylinder E′, where it becomes mixed with the vapor and ignites.

I is the reservoir, of suitable size and shape, elevated above and away from the heating

apparatus, with which it is suitably connected by a long pipe, *f*. If preferred, the reservoir may be supported upon a bracket upon the wall quite removed from the stove, so as to avoid all danger of accidents.

K is the steel valve-seat, brazed into the elbow *d*, which connects the conduit-pipe *f* with the retort-pipe *g*.

K′ is the main valve-rod, made of steel and screwing into the conical valve-seat K, as shown in Fig. 1. Near the bottom of this valve-seat is an opening, *i*, admitting the fluid from the conduit into the valve-seat. At the bottom of the valve-seat is a small opening, *o*, through which the fluid passes from the valve-seat into the retort-pipe S. Both of these openings *i* and *o* are controlled by the single valve-rod K′, so that by one valve I have a double cut-off of great security.

It will be seen that I construct my valve-seat and valve-rod of steel. This is done because the valve-rod must necessarily be made quite small, and experience shows that no metal like brass, as is always used, will stand the wear but for a short while. The stem K′ of the valve passes up through a brass pipe which is secured to the valve-seat by means of a cap and stuffing-box, *l*. The valve-rod is provided with a hand-wheel, *j*, upon its upper end. By this arrangement I am enabled to remove or repair the packing-box without removing or altering the position of the valve-rod.

g is the retort-pipe connecting the valve-seat K with the retort N. It passes under and close to the bottom of the base-plate, and through the cylinders D, E, and G. Upon entering into cylinder G it bends up, forming an obtuse elbow, and terminates in the retort directly over the center of the perforated plate and quite near the top of the cylinder E′. Pipe *g* is provided with a proper filterer.

N is the retort, formed of a globular piece of cast brass or copper, which is brazed upon the two pipes *g* and *h* at their fork. The top of this retort is provided with a square-headed screw.

h is the vapor-pipe for conveying the vapor from the retort to the burner. This pipe passes from the retort in a curve, forming a fork with pipe *g* down between the clyinders D and E, near the bottom of which it is brazed to an elbow, *m*, which passes through the side of inner cylinder, E, and terminates in the burner *o* in the center of the air-mixing chamber 3, and directly under the retort N. The burner O is regulated by means of a valve, P, (shown enlarged in Fig. 5.) A portion of the valve-rod P is filed away, as shown in drawings, so that the vapor may be permitted to escape from the burner with less turning of the screw than in valves as usually made.

R is an additional vapor-pipe extending out from the burner or from pipe *h* a little to one side of the stove. This pipe is provided with a burner, O′, and valve similar to that just described.

S is a small stove or tripod, suitably provided with perforated plate and air-mixing chambers, which is to be placed over the extra burner O′, and is intended to support an oven or other cooking-vessel.

x is an outlet-screw in the lower and outer end of pipe *g*. *y* is a similar screw in top of retort; and *z* is another similar screw in the lower end of the pipe N. When these outlet-screws are removed, a wire can be thrust in, so that the entire lengths of the pipes can be cleaned out.

In the operation of my invention, the reservoir is first filled with the fluid to be used, and the valve K is opened so as to permit a small portion to percolate through the filterer in retort-pipe. I then apply a blazing gauze lighter to the retort N. The heat thus applied soon converts the fluid in the forward end of the retort-pipe into vapor and causes it to rise into the retort N, which is exposed to the intensest heat. At this point the vapor is more completely vaporized, and is forced to travel down through the vapor-pipe *h* to the burner O. The valve P is then turned so as to let the vapor escape. The vapor rushes out and up through the air-mixing chamber 3, carrying with it a volume of atmospheric air, which becomes mixed with the vapor. This vapor-air then passes through the perforated plate H, and takes fire from the lighter, forming a blaze entirely filling the chamber 3′ within the cylinder E, and which is a continuation of the air-mixing chamber 3. At the same time a current of atmospheric air passes upward between the cylinders D and E in the annular heating-chamber 4. In its passage through this chamber the air becomes much heated and ascends and escapes through the hot-air holes *e* into the chamber 3′, thus furnishing a hot-air blast to the frame and greatly adding to the intensity of the heat. The radiated heat from the chamber 3′ and the direct heat fills the hot-air chamber 1, the heat moving as indicated by arrows marked 1. As the heat strikes the bottom of the culinary vessel, or as it gets to some distance from the central source, it becomes colder, and is forced out of the way by hotter heat, and, with the waste products of combustion, passes out through chamber 2 and escape-holes *a*, as shown by arrows 2.

By my improved apparatus my retort is enabled to furnish sufficient heat and vapor to supply a small additional stove, S. I am enabled to do this because the vapor-pipe *h* is kept warm by its position between the cylinders D and E, which prevent condensation, and because my new arrangement of hot-blast produces a degree of heat not hitherto attained in apparatuses of a similar kind.

Having thus described my invention, what

I claim as new, and desire to secure by Letters Patent, is—

1. The use in vapor-stove of a valve-seat and valve made of steel in the pipes through which the supply of the fluid takes place, in combination with the supplying and vaporizing pipes, substantially as above described.

2. The retort-pipe *g* and vapor-pipe *h*, constructed, arranged, and operating substantially as set forth, in combination with the retort N.

3. The additional vapor-pipe R and burner O′, in combination with the protected vapor-pipe *h*, for the purposes set forth.

4. The deflector-plate B, constructed and operating substantially as described, for the purpose of forming the hot-air chamber 1, and of forming the escape-chamber 2, as specified.

5. The hot-air chamber 1, around the cylinder E′, constructed substantially as set forth.

6. The stove-plate A, constructed, substantially as described, with escape-holes *a*, in combination with the top casing, C, arranged and operating as set forth.

7. The annular heating or hot-blast chamber 4, surrounding the air-mixing chamber 3, constructed and operating substantially in the manner and for the purposes specified.

8. The cap F, in combination with rods *b*, for the purpose of securing the cylinders D and E to the under side of the base-plate.

9. The valve P, constructed, arranged, and operating substantially as set forth, when in combination with the vapor-pipe *h*, the whole operating substantially in the manner and for the purposes specified.

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