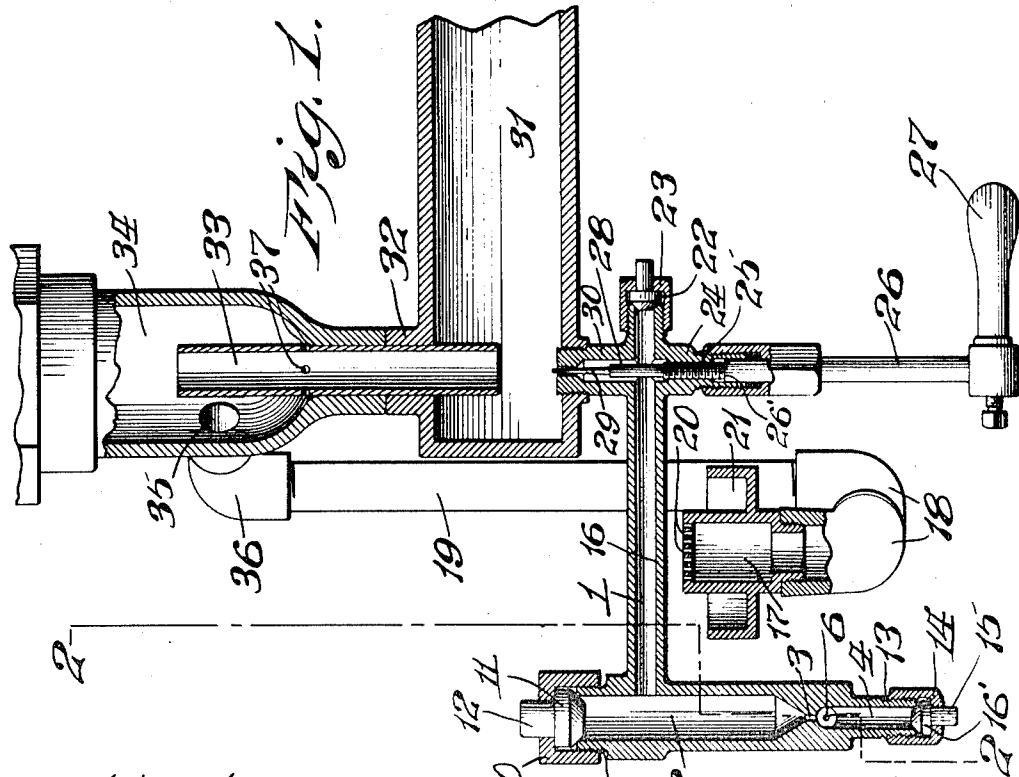
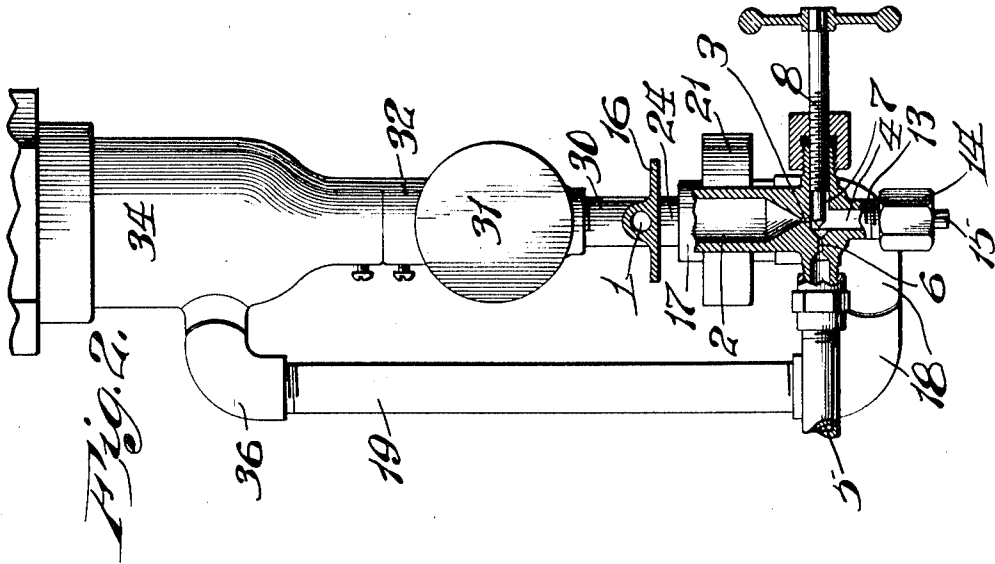


E. R. HUBER.
VAPOR GENERATOR AND MIXER.
APPLICATION FILED OCT. 26, 1910.

1,061,382.

Patented May 13, 1913.

2 SHEETS-SHEET 1.



Attest:
H. G. Hektor.
At Knight.

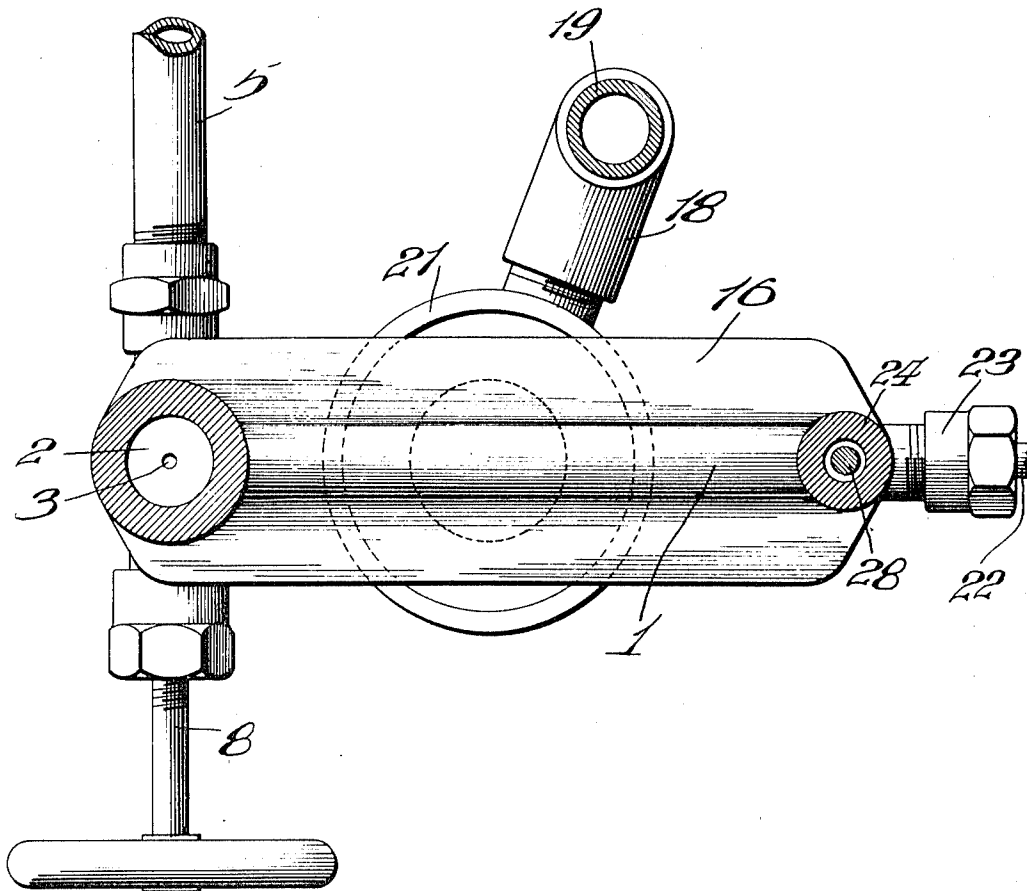
Inventors:
Edward R. Huber.
By Knight Bros attys

E. R. HUBER.
VAPOR GENERATOR AND MIXER.
APPLICATION FILED OCT. 26, 1910.

1,061,382.

Patented May 13, 1913.
2 SHEETS-SHEET 2

Fig. 3.



Attest:
Wm. H. Ford
M. C. Hamm

Inventor:
Edward R. Huber.
By Knight Bros.
attys.

UNITED STATES PATENT OFFICE.

EDWARD R. HUBER, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO FREDERICK L. POHLMANN, OF ST. LOUIS, MISSOURI.

VAPOR GENERATOR AND MIXER.

1,061,382.

Specification of Letters Patent.

Patented May 13, 1913.

Application filed October 26, 1910. Serial No. 589,215.

To all whom it may concern:

Be it known that I, EDWARD R. HUBER, a citizen of the United States, and a resident of the city of St. Louis and State of Missouri, have invented certain new and useful Improvements in Vapor Generators and Mixers, of which the following is a specification.

This invention relates to vapor burners and mixers in which volatile fluids are vaporized and superheated prior to their introduction to the mixing chamber and has for its primary object to provide an improved construction, combination and arrangement of parts in devices of this character.

The main general object of the present invention is to provide an improved device of this character which will be adapted to maintain a steady generation and flow of vapor with means for effectively controlling such flow to adapt the apparatus for use with a greater or smaller number of lamps at will, without the accompanying disadvantages so prevalent in devices of this character.

Another object is to provide an improved construction and arrangement of parts by means of which the passage of the volatile matters through the device will be made as direct as possible.

A further object is to provide an improved construction by means of which the several parts are made more accessible for cleaning.

Other and further objects will appear in the specification and be specifically pointed out in the appended claims, references being had to the accompanying drawings exemplifying the invention and in which,

Figure 1 is a longitudinal section of an apparatus constructed in accordance with the principles of this invention, parts being shown in elevation. Fig. 2 is a section on the line 2—2 of Fig. 1, parts being shown in elevation. Fig. 3 is an enlarged horizontal section of Fig. 1, taken just above the vaporizer.

In devices of the character forming the subject-matter of the present invention, there have been several very serious drawbacks to be encountered, which drawbacks were due to imperfect construction and arrangement of parts giving rise to an intermittent and spasmodic action of the gener-

ator and the necessity of employing some external agency for governing the flow through the device. Among other difficulties has been that of devising a construction which would at once effectively regulate the flow of the vapor while at the same time providing a construction which would not be difficult to keep clean, it being one of the unavoidable accompaniments of a device of this character to require frequent cleaning to secure an efficient operation thereof.

In attaining the objects of this invention, I employ an elongated tubular chamber 1 having a straight line axis. Connected up with one end of the chamber 1 and preferably integrally formed therewith is a tubular chamber 2, having a straight axis at right angles to the chamber 1 and having at its lower end a funnel-shaped inlet with a contracted inlet opening 3 connecting it with an outer well or receptacle 4 which is in turn placed in communication with a supply pipe 5 by means of a contracted passageway 6. An inlet valve 7 provided with a threaded portion 8 is coaxially mounted with the inlet passage 6 to move endwise into and out of closing relation thereto. The upper end 9 of the inlet chamber 2 is provided with screw threads for the reception of a cap 10 through a central perforation in which is removably mounted the stem 12 of a beveled plug 11, said plug 11 being provided with a beveled edge to adapt it to make a fluid tight joint with the upper end of the chamber 2. The inlet well or receptacle 4 is formed in a depending tubular projection 13 whose threaded exterior is adapted to receive a threaded cap 14 within which is removably mounted a stem 15 of a frusto-conical plug 16'. For the purpose of convenience in cleaning this portion of the apparatus, the chamber 2, passageway 3 and receptacle 4 are all coaxially alined so that when the caps 10 and 14 are removed together with the plugs 11 and 16', a tubular passageway open at both ends is provided with the narrow passageway 3 of short extent disposed intermediately of the larger open ends thereof, a construction which makes all of the tubular passageway perfectly accessible. Furthermore, the valve opening 6 and the threaded neck within which the portion 8 of the valve 7 is

threaded, are also coaxially alined and the connections are such that when the valve 7 and the supply pipe 5 are disconnected, the tubular passageway therethrough is open at both ends and has the contracted portion 6 of short extent disposed adjacent the center, making these passageways quite accessible for cleaning. Furthermore, these tubular channels constructed on intersecting axes lie within the same plane and so provide means for getting at the interior of the receptacle or well 4 from four different directions. This well 4 being a portion of the device which soon becomes clogged when in use, the importance of this construction will be appreciated.

As shown in Fig. 2 of the drawings, the elongated tubular chamber 1 is provided in the form of a hollow rib on the back or upper side of a broad flat heating plate 16, said plate 16 extending the entire distance between the inlet chamber 2 and the valve housing 24 to be hereinafter referred to. Throughout its length, said heating plate projects on either side of the tube 1 at a distance greater than the outer diameter of said tube. Immediately below the heating plate 16 and approximately midway between the chamber 2 and valve housing 24, is disposed a central sub-burner 17 connected by pipe fittings 18 with a depending tube 19 which serves to convey vapor to a plurality of burner perforations 20 in the upper end of the sub-burner 17. In order to provide means for starting the action of the burner 17 when the apparatus is cold, an annular well or receptacle 21 for inflammable fluid, such as alcohol, is provided for heating the plate 16 initially. The tubular channel 1 is continued along a straight axis to project beyond the valve housing 24 and the open end of the same is closed by the frusto-conical plug 22 retained in position by a threaded cap 23. The valve housing 24 is provided with a depending tubular projection within which a threaded portion 25 of a valve rod 26 is threaded. The valve rod 26 is provided with a handle 27. Surrounding the contracted portion 28 of the valve rod, is an elongated tapered needle valve 29 which projects through a valve opening in the top of the valve housing 24. The upwardly projecting tubular portion 30 of the valve housing 24 is provided at its upper end with exterior screw threads adapting it to be connected to the air intake tube 31. It will be noted that the valve housing 24 is thus provided with a tubular passageway extended along a straight line axis and when the threaded cap which supports the valve rod 26, is removed, together with said valve rod and valve, a straight passageway is left entirely through the valve housing which intersects the tube 1 at right angles, again

providing a readily accessible interior for cleaning purposes. Projecting upwardly through an apertured lug 32, on the upper side of the air intake tube 31, is a mixing tube 33 coaxial with the valve housing 24 and serving to center and support a vapor container 34 into which the upper end of the tube 33 projects some distance. Said tube 33 is provided at the bottom of the container 34 with apertures 37 for returning condensed portions of the vapor, should there be any, back into the mixing tube 33 to be revaporized. The discharge outlet 35 is connected by an elbow 36 with a depending tube 19 leading to the sub-burner 17. Said outlet 35 opens through the wall of the container 34 below the upper end of the tube 33 but above the apertures 37.

The operation of my apparatus will now be readily understood, and briefly stated is as follows: A little alcohol or other combustible fluid burned in the trough 21, serves to initially heat the plate 16 to start the action of the apparatus. The admission valve 7 being retracted from the inlet 6 just sufficiently to permit a conical film of fluid to discharge therefrom, only a small portion of such fluid is drawn through the passageway 3 into the inlet chamber 2. As the action proceeds, the condition of the vapor passing through the tube 19 to the burner openings 20 gradually improves and becomes ignited, thus heating the plate 16 to a higher and higher degree. Eventually, the plate 16 and tube 1 become red hot, the chamber 2 becoming heated by conduction until the fluid becomes vaporized immediately upon its passage through the channel 3. In passing through the passage 1, the vapor becomes superheated. A little manipulation of the valves 7 and 29, serves to perfectly control the action of the apparatus and by reason of the extended heating channels and the intense heat to which the vapor is subjected, the action of the device proceeds in an even, well-sustained manner and may be regulated to supply either one or any number of burners. In various devices of this kind, it is common and necessary to provide a quantity of packing within the vaporizing tubes in order to overcome the spasmodic action hereinbefore referred to. This, however, is obviated by the present invention. The action is furthermore greatly improved by the readiness with which all of the device may be cleaned owing to the fact that each of the tubular passages is open at both ends, and in those parts in which there is a contracted passage, such contracted passage is of short extent and disposed intermediately of two enlarged portions of the tubes.

What I claim is.

1. In an apparatus of the character described, the combination with an inlet chamber and a valve chamber distant therefrom,

of a tubular chamber connecting said inlet chamber with said valve chamber, and a heating plate extending throughout the length of said tubular chamber, and connecting said vaporizing chamber and said valve chamber.

2. In an apparatus of the character described, the combination with an air intake, of a valve chamber depending therefrom, a fluid inlet chamber spaced from said valve chamber, a broad flat heating plate rigidly connecting the walls of said chambers, said heating plate being provided with an integrally formed tube of relatively small diameter connecting said valve chamber to said inlet chamber, and means for heating said plate.

3. In an apparatus of the character described, an integral casting comprising a fluid inlet chamber and a valve chamber disposed at a distance therefrom, a broad flat heating plate integrally connecting the walls of said chambers and provided with a protuberant rib hollowed interiorly to provide a passageway connecting said inlet chamber with said valve chamber, and means for heating said plate.

4. In an apparatus of the character described, the combination with a fluid inlet

chamber, of a valve chamber distant therefrom, a tube of relatively small diameter in comparison to its length connecting said chambers, the under wall of said tube being provided with an integral heating plate conductively connecting the walls of said chambers and projecting on each side of the outer lateral wall of said tube a distance approximately equal to the outside diameter of the tube, and means for heating said heating plate.

5. In a device of the character described, the combination with a vertically disposed inlet chamber, of a vertically disposed valve chamber distant therefrom, and a horizontally disposed generator chamber connecting said inlet chamber with the valve chamber; said generator chamber being of relatively small cross section to the inlet chamber and having one wall thereof provided with a heating plate extending from said inlet chamber to the valve chamber; said heating plate being of relatively great width to the diameter of said inlet chamber.

EDWARD R. HUBER.

In presence of—

A. O. KNIGHT,
J. B. MEGOUN.