

C. M. KRUGER.
VAPOR GENERATOR.
APPLICATION FILED JAN. 29, 1912.

1,042,355.

Patented Oct. 22, 1912.

2 SHEETS—SHEET 1.

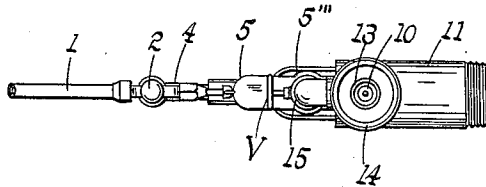


FIG. 2.

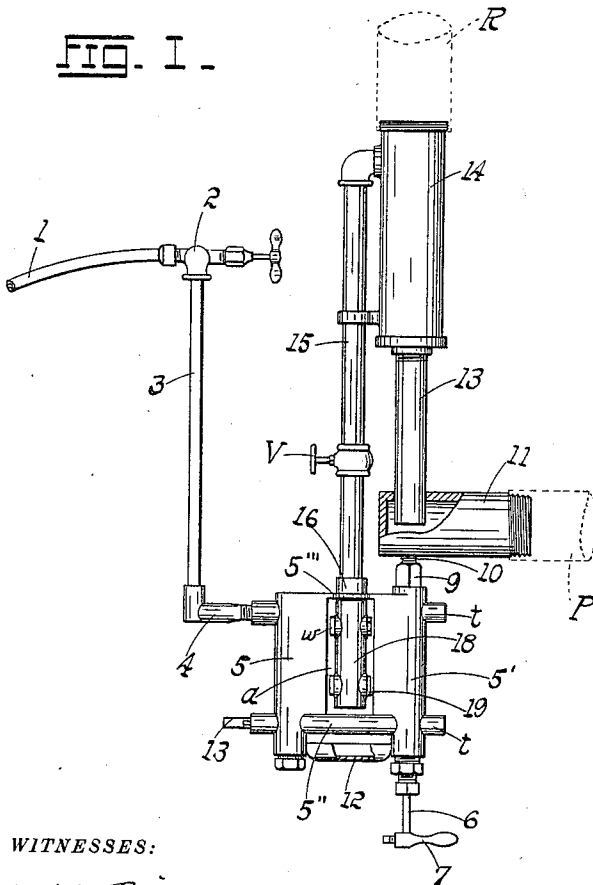


FIG. 1.

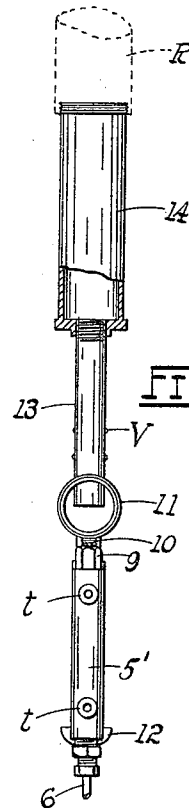


FIG. 3.

WITNESSES:
Harry A. Reimer
Fannie C. Weber.

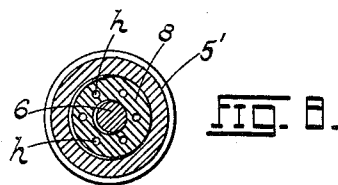
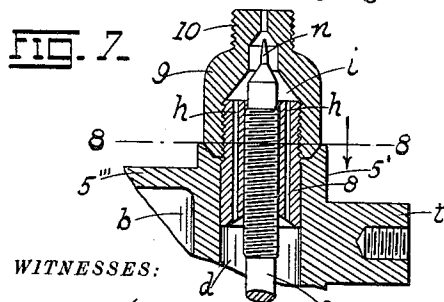
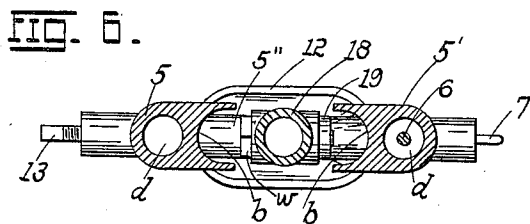
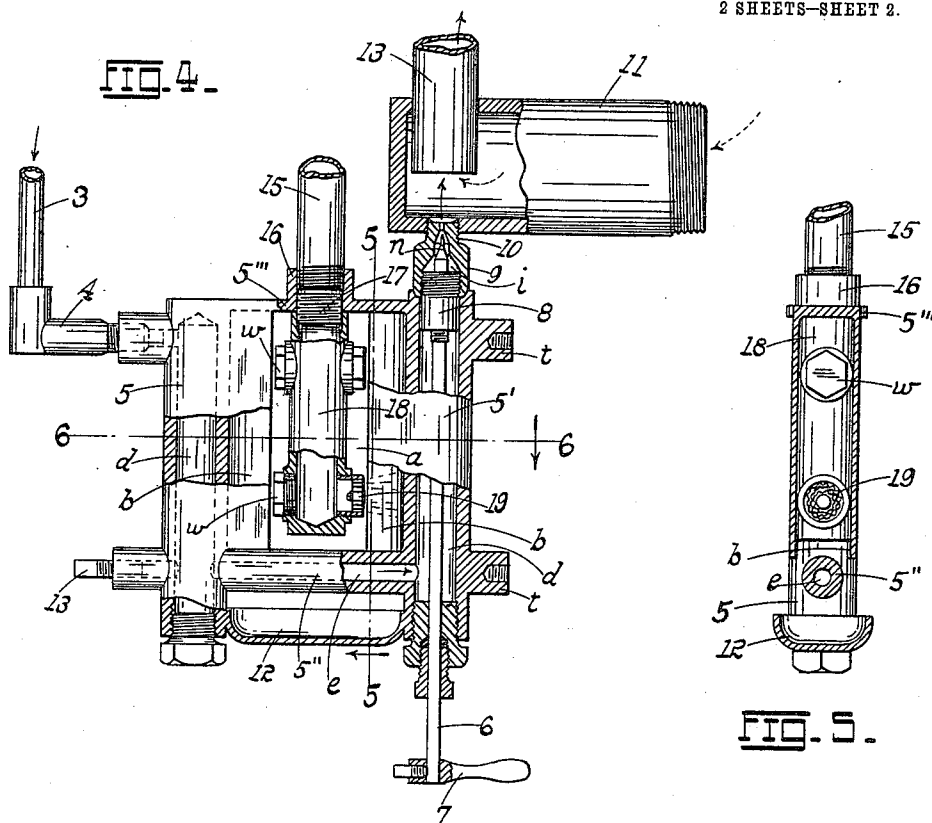
INVENTOR.
Charles M. Kruger.
BY
Eugene H. Loren
ATTORNEY.

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WITNESSES:

Harry A. Beimes

Fannie B. Weber

INVENTOR.
Charles M. Kruger.
BY *Emil H. Hare*
ATTORNEY.

UNITED STATES PATENT OFFICE.

CHARLES M. KRUGER, OF HANNIBAL, MISSOURI.

VAPOR-GENERATOR.

1,042,355.

Specification of Letters Patent.

Patented Oct. 22, 1912.

Application filed January 29, 1912. Serial No. 674,172.

To all whom it may concern:

Be it known that I, CHARLES M. KRUGER, citizen of the United States, residing at Hannibal, in the county of Marion and State of Missouri, have invented certain new and useful Improvements in Vapor-Generators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part hereof.

My invention has relation to improvements in vapor-generators for hydrocarbon burners (or other purposes); and it consists in the novel details of construction more fully set forth in the specification and pointed out in the claim.

In the drawings, Figure 1 is a side elevation of the invention; Fig. 2 is a top plan thereof; Fig. 3 is a vertical edge view looking toward the left on Fig. 1, parts being broken; Fig. 4 is an enlarged combined side elevation and section of the generator; Fig. 5 is a vertical transverse section on the line 5—5 of Fig. 4; Fig. 6 is a horizontal section on the line 6—6 of Fig. 4; Fig. 7 is a middle vertical section of the bushing and socket cooperating with the vapor-controlling valve; and Fig. 8 is a cross-section on the line 8—8 of Fig. 7.

The object of my invention is to construct a vapor-generator which will completely vaporize the hydrocarbon liquid (gasolene or its equivalent) employed as the fuel for lighting or heating purposes; one which will not clog; one containing a minimum number of parts; one which may be readily manipulated and the parts thereof quickly assembled, or taken apart for purposes of cleaning; one which is light and durable; one delivering a uniform product to the service pipe; and one possessing further and other advantages better apparent from a detailed description of the invention which is as follows:—

Referring to the drawings, 1 represents a copper tube leading from any suitable source of hydrocarbon supply (not shown) which conducts the gasolene to a valve-controlled casing 2 from which it passes through a pipe 3 to an elbow 4 screwed to the adjacent leg 5 of a casting which constitutes the body of the generator. This casting has two parallel vertical legs 5, 5', separated by a space *a*, the inner concave walls *b* of the legs facing said space *a*. The legs 5, 5', are provided with parallel passages *d*, *d'*, which

are connected at the bottom by a cross passage *e* in the bottom cross-member 5'', the passage of the leg 5' being traversed by the stem 6 of a screw needle valve *n* (provided with a bottom operating handle 7), the upper threaded portion of the stem passing through a plug or bushing 8 at the upper end of the leg, the upper projecting end of the plug being coupled to a hollow socket 9 terminating in a screw-nipple 10 which screws into the bottom of the member 11 constituting the mixing chamber. The open end of said member 11 has provision for coupling the same to an air supply pipe *P*. Disposed in the plug 8 about the stem 6 are a series of passages *h* which collectively discharge into the chamber *i* of the socket 9, the discharge from which is controlled by the needle-valve *n*. Below the member 5'' is disposed a starting basin 12 into which alcohol or equivalent fuel may be poured and ignited for initially heating the walls of the body of the generator. One end of the passage *e* is closed by a plug 13 which may be removed for purposes of cleaning said passage, the leg 5' having formed thereon screw-sockets *t*, *t'*, for receiving the ends of suitable supporting rods (not shown).

Passed through the upper wall of the mixing chamber directly over the needle valve *n* (or point of discharge of the vapors from the chamber *i* of the socket 9) is a pipe 13 leading from the bottom section 14 of the service pipe or riser *R* (the section 14 being practically a part of the riser). From the riser 14 leads a downtake or shunt 15 (provided with a valve *V*) the lower end of which screws into the hollow boss 16 of the upper cross-member or brace 5''' of the casting, the boss likewise receiving a hollow coupling or nut 17 to which is secured the upper end of the hollow burner head 18 mounted in the space *a* between the concave walls or faces *b* of the legs 5, 5'. The head 18 has provision for a suitable number of burners 19, though in practice one such burner will suffice. This burner is screwed into the wall of the head 18 and faces one of the concave walls *b* of the leg 5' (or 5). The head 18 practically forms the lower terminal or extension of the shunt 15, bringing the burners 19 thereof in close proximity to the faces *b* of the casting, the concavities of which faces serve to form flues for the flames issuing from the burners, bringing the flames too, in close proximity

to the walls of the legs and hence heating them to the best advantage to maintain the vaporizing action in the casting 5, 5', 5'', which serves as the generator proper.

5 The operation of the generator may be described as follows:—Alcohol or some other inflammable substance is poured into the basin 12 and ignited, and the gasoline turned on by opening the valve 2. The stream traverses the passages *d*, *e*, *d*, and as it flows through the passageway *e* the walls of the member 5'' heated by the alcohol flame, vaporize the same. The vapors flow through the passages *h* of the bushing 8 and collect in the chamber *i* of the socket 9, the outlet from which is controlled by the valve *n* on the stem 6. The vapors are projected into the mixing chamber 11 into which air is free to flow, the mixed gases thence flowing into the riser R. A portion of the gas is shunted through the pipe 15 into the burner head 18, and by igniting the gas at the burner 19 the flame therefrom afterward serves to permanently heat the walls of the casting (5, 5', 5''), so that the starting flame is no longer necessary. The concavity of the wall *b* serves as a flue for the burner flame, the products of combustion traversing the full length of said wall and hence imparting a maximum number of heat units to the casting or body of the generator. The burners 19 may be attached so as to heat one or both walls, sufficient sockets being provided for the purpose. In Fig. 4, only one burner is shown, the remaining sockets being closed by plugs *w*. The location of the burner head 18 in the space *a* between the legs 5, 5', is important, the best heating results being effected. The bushing

8 with its series of passage-ways *h* serves as a strainer, and should one or more of the passages thereof become clogged, a sufficient number would still be in condition to conduct the vapor to the collecting chamber *i* of the socket 9. By unscrewing the socket 9 (it being attached to the bushing 8 and member 11 by right and left hand screw-threads respectively) the bushing is made accessible and can be cleaned when necessary.

Features shown but not alluded to are old in the art and require no description in the present connection.

The casting 5, 5', 5'', being a single integral member has no joints to corrode and hence can last indefinitely.

Having described my invention, what I claim is:—

In a vapor generator, a body portion comprising a pair of parallel members spaced apart and traversed respectively by intake and discharge passage-ways, a cross member having a passage connecting the aforesaid passage-ways, the walls of the parallel members facing the space being concaved, a burner member positioned in the space between the concaved faces, a mixing chamber at the discharge end of the generator, and means for conducting a quantity of the mixture from the mixing chamber to the burner member.

In testimony whereof I affix my signature, in presence of two witnesses.

CHARLES M. KRUGER.

Witnesses:

EMIL STAREK,

FANNIE E. WEBER.