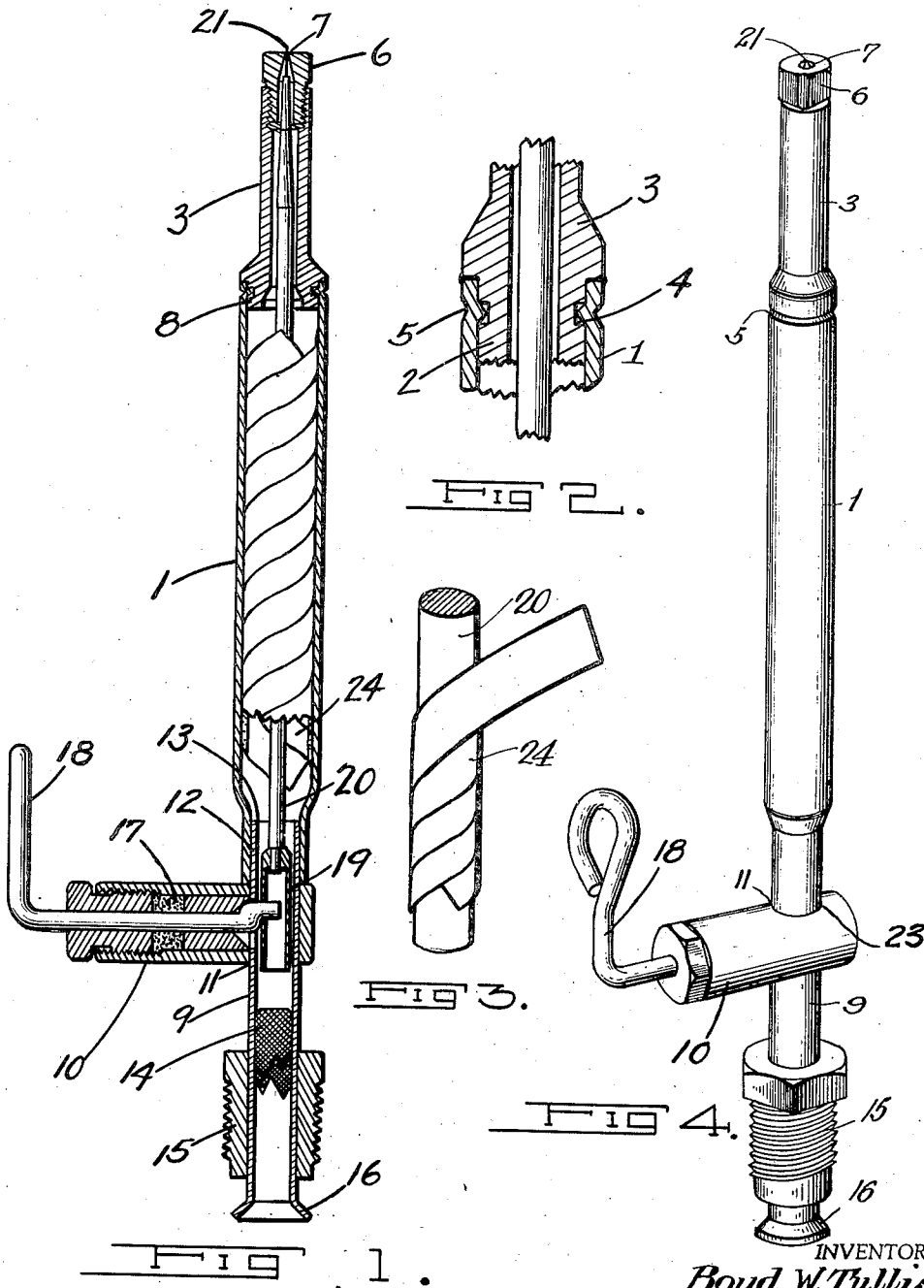


May 11, 1937.

B. W. TULLIS
VAPORIZING GENERATOR
Filed May 18, 1934

2,079,779



INVENTOR.
Boyd W. Tullis
BY *B. F. Funk*
ATTORNEY.

UNITED STATES PATENT OFFICE

2,079,779

VAPORIZING GENERATOR

Boyd W. Tullis, Wichita, Kans.

Application May 18, 1934, Serial No. 726,308

1 Claim. (Cl. 158—53)

This invention relates to vaporizing generators of the type in which an elongated tube is employed for vaporizing liquid hydrocarbon fuel. The liquid hydrocarbon fuel passes through the tube which is heated by an external flame either from the burner or a torch so that the tube really constitutes a miniature retort.

The tube is provided with a small tip orifice with which a cleaning needle is associated to keep the tip orifice open. This necessitates the utilization of an elongated stem which runs the length of the tube.

In actual practice the interior of the tube is usually provided with a packing of wick-like construction between the stem and the wall of the tube. Without the packing or filling, the burner tends to pulsate because of the intermittent localized vaporization of the fuel, it being understood that the flame does not contact the entire tube. If a fibrous filler is put in the space between the stem and the wall of the tube, the liquid fuel seems to be vaporized more evenly and uniformly, due, it is thought, to the fact that the retort with the filler acts after the manner of a still and the pulsation at the burner is not so noticeable. However, carbon forms in generators, and if the filler occupies the entire space between the stem and the inner wall of the generator tube the carbon accumulates until the stem becomes stuck or frozen in the tube with the result that it cannot be operated to cause the tip cleaning needle to function, and in some cases, the generator becomes clogged so that it loses its efficiency. Then, a new generator must be substituted in a lamp or stove.

Prior to my invention attempts have been made to remedy this defect by placing a coil about the stem and then putting a filler between the coil and the tube wall. This, in a measure, overcomes the above enumerated objection as to freezing or clogging, but inasmuch as the free space between the stem and the coil is very slight, carbon accumulates and causes the stem to stick and also causes the generator to clog. In view of the above difficulties I have provided a generator which will have all the advantages of any of the above named constructions and a minimum amount of the disadvantages. I have found that a tube provided with a lining of sheet fibrous material will have all of the advantages of a filler and will in addition, provide a relatively large space around the stem to increase what is commonly known as the carbon space so the active life of the generator is materially increased be-

cause danger of carbon accumulation will be reduced and danger of appreciable pulsation at the burner will be practically eliminated.

I have also provided a novel arrangement of tube assembly for the generator which will materially reduce the manufacturing cost and since the vaporizing generator in a stove or lantern is essentially a renewal part, the advantage of manufacturing cost reduction will be appreciated.

The novelty of the invention will be clearly understood by reference to the following description in connection with the accompanying drawing in which:

Figure 1 is a vertical longitudinal sectional view through a vaporizing generator constructed in accordance with my invention;

Figure 2 is an enlarged sectional view through the tip bushing and part of the retort tube, a fragmentary view of the tip cleaning needle stem being shown in elevation;

Figure 3 is a fragmentary view of the needle stem and the fibrous lining partially wound thereon, and

Figure 4 is a perspective view of the completed generator.

The generator is shown as comprising an elongated retort tube 1 at the upper end of which is a constricted portion 2 of a tip bushing 3. The tip bushing is provided with a circular groove 4 into which part of the tube 1 is pressed as indicated at 5 to fasten the two together. At the outer end of the bushing 3 is a tip 6 provided with an outlet orifice 7 through which the vaporized fuel is fed into the burner or mixing chamber (whether it be a mantle or other form of burner).

The retort is larger than the bushing 3 so there is a shoulder 8 formed at the outer end of the tube 7. The other end of the tube 1 is sleeved over a tube 9 which carries a sleeve 10 provided with a transverse opening 11 through which the tube 9 extends. The projected end 12 of the tube 9 forms a stop or shoulder 13 within the retort tube 1 as will be presently explained. The tube 9 may be provided with a strainer 14 and on its outside it may carry a nipple 15 to be received in a fitting to seat the flared portion 16 of the tube 9 in the fitting to make a connection.

The sleeve 10 is in the form of a packing gland with packing 17 therein and it receives a crank 18 which is connected to the end 19 of the needle stem 20. The stem extends throughout the generator and has a needle 21 at its upper end to clean the opening 7 as is well understood.

The member 3 is secured to the tube 1 and the

tube 9 with the sleeve 10 on it, is inserted in tube 1 and then the parts are secured together preferably by silver soldering at 11 and 23. The sheet of fibrous material is then wound on the stem which is inserted through the tube 9 into the tube 1 and inasmuch as it has an inherent expansibility, as soon as it has completely entered the tube 1 it will expand against the inner wall of the tube leaving a relatively large flow space 24 between the stem and the lining, the lining resting in intimate contact with the inner wall of the tube and held against longitudinal movement in one direction by the stop formed by the end of the tube 9 and in the other direction, by the end of the bushing 3.

The crank for reciprocating the needle stem may now be inserted with the packing and the generator will be complete, it being understood that the nipple 15 has been sleeved on the tube 9 before it is fastened to the tube 1.

The inherent expansibility of the sheet is an important feature of the invention because it enables it to expand in place to leave the tube needle stem free to operate and to provide a relatively large carbon accumulating space which will permit a considerable quantity of carbon to accumulate before the generator has its efficiency impaired. It is to be understood of course that the lining to some extent, acts as a heat distributor for the heat in that it prevents localized application of heat to the incoming stream of hydrocarbon fuel. Instead, the liner is heated over a relatively larger area than the tube and causes a gentle vaporization rather than a violent one so that the fuel at the burner end is combusted in a relatively steady flame. In other words the spiral lining assists in vaporizing the incoming liquid fuel in such a manner that there will be no violent agitation in the generator tube. The vaporization of the liquid fuel will be gentle enough to prevent agitation but will be fast enough to supply the burner with the necessary vaporized fuel. If the liquid fuel was locally vaporized there would be danger of pulsations in

the light at the burner. This is highly important in a lamp structure.

A device constructed in accordance with my invention is easy to assemble and in actual practice I have found that it remains effective as a generator for a longer period than any of the devices described in the preliminary part of this description.

I prefer to employ an asbestos sheet as I find this adequately serves the purpose. Indeed, it seems to be the best material now available, but I do not wish to be limited for all purposes to the exact material mentioned, and while practice has indicated that the ideal way of introducing the strip or liner into the tube 1 is by spirally winding it, I am aware that good results could be obtained by folding the longitudinal edges of a strip one over the other around the stem and after the liner is inserted, permitting it to expand in the tube 1.

It will also be noted that by winding the liner about the stem 20, the same can be introduced into the vaporizing tube after the tube 9 is secured thereto. This eliminates the necessity for introducing the filler into the lower end of tube 1 and then securing an adapter to the same with a smaller tube 9 to fasten to the lamp fitting. Obviously, a packed wick could not be inserted through the tube 9 into the tube 1 on account of its small diameter, but with an expansible liner this is possible.

I do not wish to be limited to the exact details of construction shown but reserve the right to make such changes in form, proportion and minor details of construction as properly come within the scope of the appended claim.

What I claim is:

A vaporizing generator including a metallic tube; and a porous liner formed of a strip of material having inherent expansibility and spirally wound to cause it to expand outwardly against the inner wall of the tube to closely engage the said wall.

BOYD W. TULLIS.