R. BUSCH.

APPARATUS FOR PRODUCING CARBURETED AIR.

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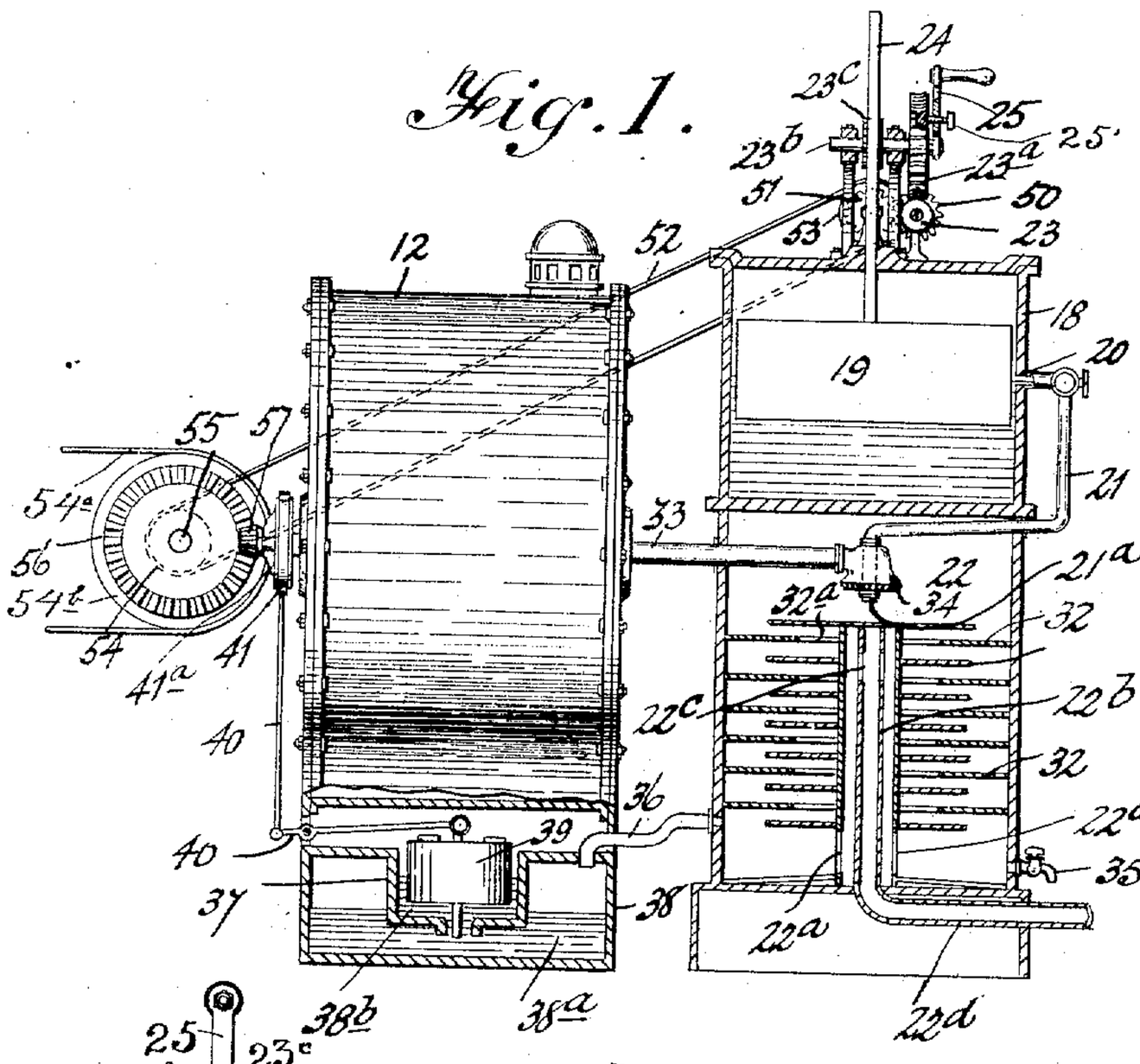
976,781.

Patented Nov. 22, 1910.

Fig. 1.



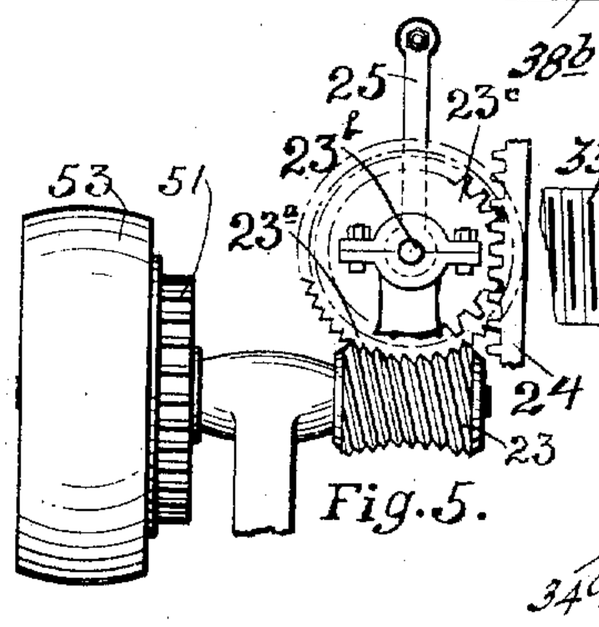


Fig. 5.

Fig. 2.

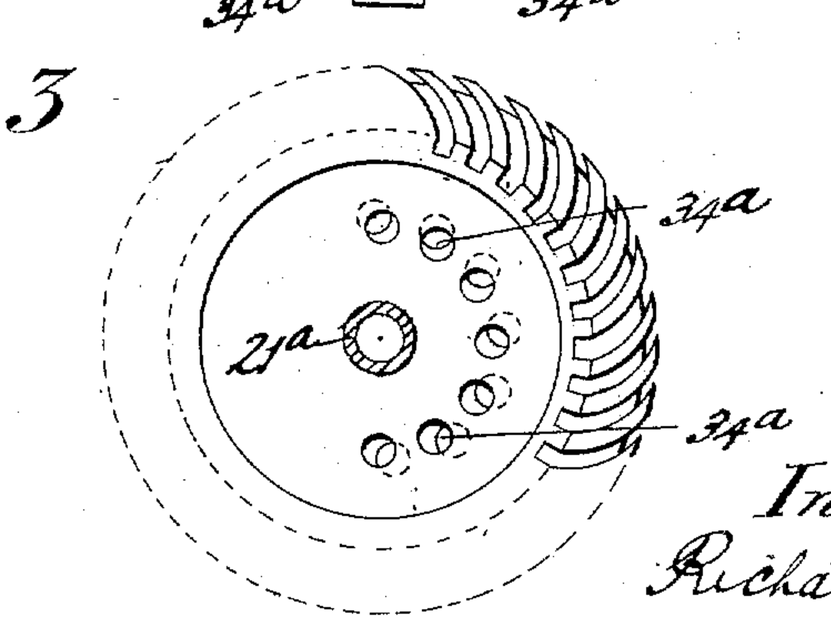


Fig. 3

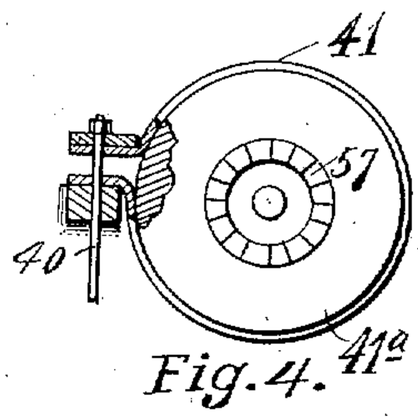


Fig. 4.

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR PRODUCING CARBURETED AIR.

976,781. Specification of Letters Patent. **Patented Nov. 22, 1910.**

Application filed January 15, 1907. Serial No. 352,421.

To all whom it may concern:

Be it known that I, RICHARD BUSCH, a subject of the German Emperor, residing at Hanover, Germany, have invented certain new and useful Improvements in Apparatus for Producing Carbureted Air, of which the following is a specification.

This invention relates to improvements in apparatus for producing carbureted air.

By the improved apparatus gas of the highest degree of purity and of uniform composition is produced. The term "gas" used throughout the specification is used to indicate the mixture properly speaking of vaporized gasolene and air.

In the improved apparatus the liquid to be gasified is conveyed in a continuous jet to the carbureter proportionally to the action of an air compressor. The carbureter is so constructed that the air causes the liquid distributed therein to take a centrifugal and centripetal path. This is effected by means of a series of nozzles arranged for the entry of the air concentrically about the gasolene jet and discharging in oblique or tangential directions.

The air to be carbureted is contained in a suitable reservoir and is brought to the pressure at which it is used by means of the air compressor which is of suitable construction and actuated by a suitable driving mechanism or motor.

Means are provided whereby if the pressure in the carbureter becomes too great the action of the air compressor is retarded or stopped.

Referring to the annexed drawings, Figure 1 is a section of the carbureter in connection with the compressor. Fig. 2 is a vertical section through the spraying nozzle supplying compressed air and gasolene to the carbureter, and Fig. 3 is a detail plan view of the air spraying plate of said nozzle. Fig. 4 is a detail of the brake drum and band; and Fig. 5 is a detail of the mechanism on top of the member 18 of Fig. 1.

The gasolene distributer consists of a chamber 18, in which a piston 19 is adapted to raise and lower the level of the gasolene at the will of the operator, and, by the following described mechanism; viz:—said piston is of smaller diameter than the interior of the chamber. Therefore when it is pressed down, the gasolene is forced up around its periphery and finds vent through the opening 20; and, when the piston is lifted, the gasolene recedes and the flow, at 20, ceases. Said piston is provided with a rack 24, which engages a toothed wheel 23^c, on a shaft 23^b, on which is loosely mounted a worm wheel 23^a, and having a hand crank 25, secured thereto. A means is shown at 25′, for locking the worm wheel rigidly to the crank, so that it will rotate with the shaft 23^b. Said worm wheel is actuated by a worm 23, which is driven by the toothed wheel 50, the two wheels being keyed to the same shaft, and the latter one meshing with a wheel 51, which is keyed to the same shaft as the wheel 53. The latter is driven by flexible transmission means 52, from the wheel 54 on the shaft 55. Said shaft is driven from any ordinary source of power, through the medium of transmission means, shown at 54^a, 54^b, which actuates in addition to the mechanism described, a gear means 56, 57, by which an air compressor 12 of ordinary type is actuated. Keyed to the shaft which carries wheel 57, is a brake drum 41^a, for the purpose hereinafter stated. By the mechanisms described in the foregoing, the air compressor and gasolene feed are actuated simultaneously; the piston 19, being gradually lowered by means of the rack 24, and the gearing associated therewith. When it is desired to refill the chamber 18, the thumb screw 25′, is disengaged from the worm wheel so that the shaft 23^b, may be rotated independently of wheel 23^a; and by rotating the wheel 23^c, by means of the crank 25, the piston 19 is raised; thus making room for another charge of gasolene; whereupon the worm wheel may again be locked by means of the thumb screw and the carbureting process set in action.

In comparison with hitherto used gasolene distributing apparatus which convey the gasolene intermittently to the carbureter by which the different boiling temperatures and various specific gravities of gas producing liquids produce a temporarily uneven gas production, the present gasolene distributer is such that the gasolene is conveyed to the carbureter in the form of a constantly flowing jet so that the heavy and light particles simultaneously enter the carbureter and are carbureted at the same time. The production of gas is thus as uniform as possible

and any temporary or periodical change in the gas production is obviated by the inflowing air being only supplied with that quantity of gasolene with which it can be easily and properly mixed.

The gasolene or the like fed out of the chamber 18 by the piston 19 flows through the pipe 21 direct to the carbureter chamber 22 and is discharged centrally therein through the pipe 21^a passing through the air nozzle 34.

The carbureter here illustrated consists of the chamber 22 in which plates 32 are arranged concentrically above one another which are alternately of circular and annular shape so that the air current passes alternately over the periphery of one, and through the annular aperture 32^a of the next and so on. The air from the compressor 12 passes through the pipe 33 into the nozzle 34 provided with concentric series of apertures 34^a arranged obliquely or tangentially in such a manner that the air currents are discharged therefrom obliquely onto the uppermost plate 32 so as to set up a rotary air current or vortex and the gasolene flowing out centrally at the same time through the pipe 21^a onto the said plate 32 is centrifugally distributed over the plate and is driven centrifugally over the same on to the plate 32 immediately below passing thereover centripetally and through the central annular aperture of the following plate and so on until the vaporization is complete. The number of plates is according to the efficiency required of the carbureter.

The particular advantage of the carbureter consists in the fact that the freshly introduced air immediately encounters fresh gasolene on the uppermost plate and from the inlet to the outlet travels in the same direction as said gasolene which is necessary for producing an even mixture. The rotary direction of the air currents prevents the gasolene from flowing in radial lines over the plates which would not afford a sufficiently large operative surface to said air currents. The outlet of the carbureter is also centrally arranged, the mixture passing through apertures 22^a up through the central tube 22^b of the carbureter and through apertures 22^c into the discharge pipe 22^d. The plates 32 themselves act also similarly to radiator plates of heating apparatus and convey heat to the surfaces cooled during the process of vaporization. At the bottom of the carbureter a test cock 35 is arranged for enabling the process to be tested at any time. When the compressor 12 is actuated by motor power or the like, it is necessary to provide the apparatus with a governor. For this purpose a float brake is provided which at normal pressure in the compressor remains inactive but comes into operation at any undesired increase of pressure. The float can be adjusted for any desired margin between the normal pressure and that at which the brake is to act. The advantage of providing this margin is that the brake need not act continuously and the resistance of the compressor, which increases with the increase of pressure, may be fully utilized within this margin without the pressure regulator of the outlet main being actuated or influenced. The air under pressure in the compressor 12 passes through the pipe 33 into the carbureter 22 as aforesaid and from the latter through another pipe 36 into a cylindrical chamber 38 divided into an outer and an inner compartment 38^a and 38^b respectively by an annular partition 37. A liquid in the chamber 38 forms a seal between said outer and inner compartments. In the inner compartment is located a float 39. If the pressure rises above a certain point the said float is immediately lifted thus breaking the action of the compressor by means of a system of rods 40 and a band brake 41 acting on a drum 41^a on the compressor shaft. The latter may be driven from the shaft 55 by means of beveled wheels 56 and 57. When the pressure falls the float sinks and releases the brake acting on the compressor. By adjusting the weight of the float and the braking mechanism 41 the brake may be regulated to operate at any pressure.

A disengaging device of any suitable kind for the motor (not shown) may be arranged at any convenient position on the apparatus. For instance a friction clutch arranged in the driving gear, or an ordinary belt shifter could be used.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. In apparatus for producing carbureted air the combination of a carbureting chamber, a series of superposed alternating circular and annular plates therein, a gasolene chamber, means of communication from the latter to a point within the carbureting chamber centrally above the uppermost plate, a displacing piston in said gasolene chamber adapted to feed the gasolene through said means of communication, an air compressor, means connecting said piston and compressor to give related movement thereto and means for passage of air from the compressor to the carbureting chamber to points surrounding the gasolene inlet.

2. In apparatus for producing carbureted air the combination of a carbureting chamber, a series of superposed alternating circular and annular plates therein, a gasolene chamber, means of communication from the latter to a point centrally above the uppermost of said plates, a piston in said gasolene chamber adapted to force the gasolene through said means of communication, a ro-

tary air compressor, means for operating the piston proportionally to the operation of the air compressor, an air inlet nozzle within the carbureting chamber surrounding the gasolene inlet and having divergent discharge apertures, means of communication between said nozzle and the air compressor, a float controlled by the pressure of the carbureted air from said carbureting chamber, and a brake controlled by said float operating on the air compressor.

In testimony whereof I have signed this specification in the presence of two witnesses.

RICHARD BUSCH.

Witnesses:
MARTA L. THOMPSON,
HEDWIG LEIMER.