

Nov. 12, 1940.

C. E. ENNIS

2,221,472

AUXILIARY ENGINE FEEDING DEVICE

Filed Nov. 14, 1938

Fig. 1.

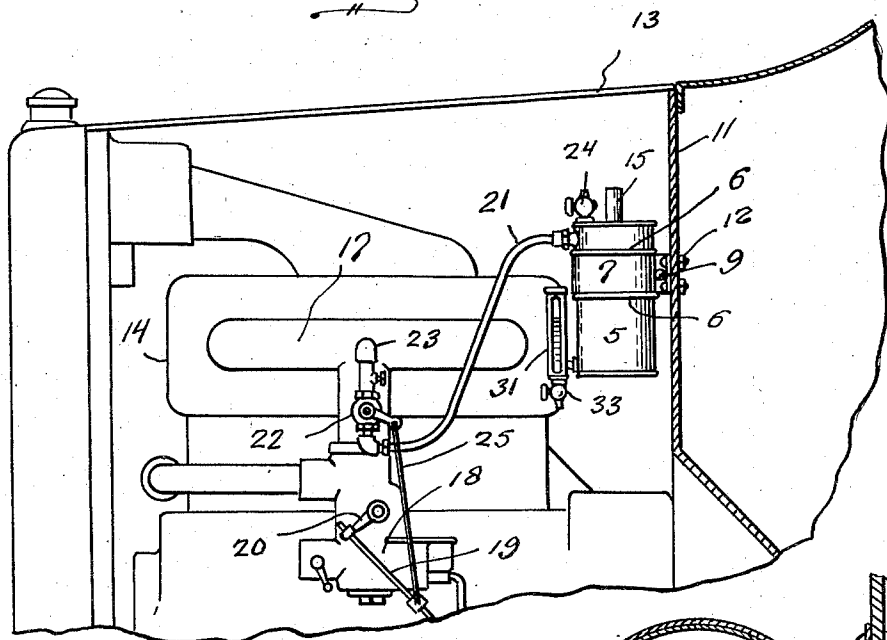


Fig. 2.

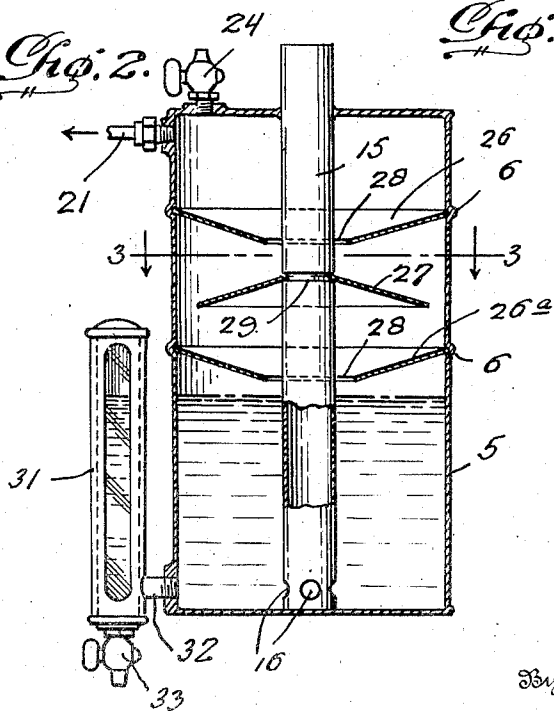


Fig. 3.

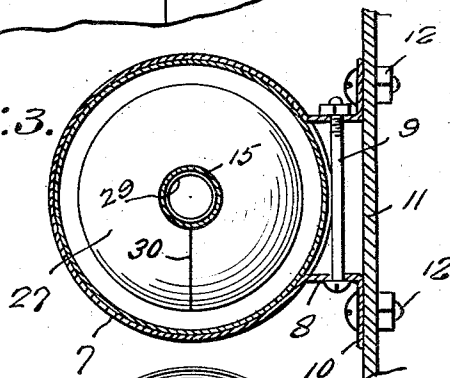
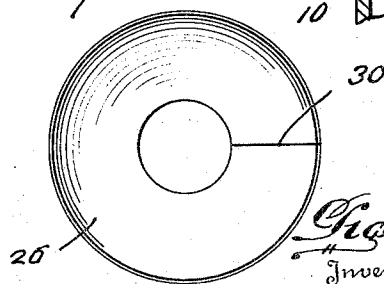


Fig. 4.

Inventor
Charles E. Ennis,

By *Stanley Burch*
Attorney

UNITED STATES PATENT OFFICE

2,221,472

AUXILIARY ENGINE FEEDING DEVICE

Charles E. Ennis, Albuquerque, N. Mex.

Application November 14, 1938, Serial No. 240,407

1 Claim. (Cl. 261—121)

This invention relates to an auxiliary engine feeding device of the type broadly shown in U. S. Patent No. 1,822,962, issued September 15, 1931 to myself and H. W. Crawford.

More particularly, the present invention relates to an auxiliary device that is connected to and supplies to the intake manifold of a gas engine, vapor composed of additional air charged with a liquid, such as water, gasoline, kerosene, etc.

The primary object of the present invention is to provide an improved feeding device of the above kind that is composed of a few simple parts so that it may be economically manufactured, that is highly efficient in operation, and that may be readily installed.

Another object of the present invention is to provide means for regulating the quantity of vapor discharged from the device in proper proportion to the volume of ordinary explosive charge supplied to the intake manifold from the engine carburetor.

The present invention consists in the novel form, combination and arrangement of parts hereinafter more fully described, shown in the accompanying drawing, and claimed.

In the drawing:

Figure 1 is a fragmentary view, partly in side elevation and partly in section, showing the present invention applied to an automobile.

Figure 2 is a vertical sectional view of the liquid reservoir forming part of the invention shown in Figure 1.

Figure 3 is a horizontal section on line 3—3 of Figure 2; and

Figure 4 is a bottom plan view of one of the baffle plates forming part of the construction shown in Figures 2 and 3.

Referring in detail to the drawing, the present invention includes a liquid reservoir or tank 5 which is preferably of cylindrical form and provided around the body thereof with spaced parallel outwardly pressed annular beads 6. A clamping band 7 snugly fits around the body of tank 5 between the beads 6 and has outturned ends 8 adjustably connected by a clamping screw 9 so that the band may be tightly clamped about the body of the tank 5. The outturned ends 8 terminate in laterally directed ears 10 arranged to flatly abut the dash 11 of the automobile and to be bolted thereto as at 12, whereby the tank may be firmly or rigidly mounted within the hood 13 of the automobile which houses the engine 14.

The tank 5 is adapted to be partially filled with the desired liquid, and is provided with an air in-

take pipe 15 secured in and extending centrally through the top wall of the tank 5 downwardly into the liquid and terminating on the bottom of the tank. The lower end of air inlet pipe 15 is provided with a plurality of side openings 16 permitting passage of the air from the lower end of pipe 15 into the surrounding liquid.

The engine 14 has the usual intake manifold 17 to which explosive charges are supplied from a carburetor 18, the volume of such explosive charges being varied by means of the usual foot-operated accelerator including the usual link 19 extending to the valve lever 20 from the usual foot pedal, not shown.

A flexible pipe or tube 21 is suitably coupled at one end to a control valve 22 preferably of the wear-compensating turn plug type including a casing with a tapered bore and a correspondingly tapered rotary plug yieldingly urged to constantly fit snugly in the bore by means of a spring as is well known in the valve art. The other side of valve 22 is coupled to a fitting 23 tapped into the manifold 17 above the carburetor 18 as shown, or suitably placed in communication with the interior of said manifold in any suitable way, such as by means of the gasket fitting 11 disclosed in the above-mentioned patent. The other end of tube or pipe 21 is coupled to a top outlet of tank 5 as clearly shown in Figures 1 and 2, and provided in the top of tank 5 is an air relief valve or pet cock 24 adapted to be opened for permitting escape of air from the upper portion of tank 5 as it is displaced by introduction of liquid into the lower portion of tank 5 through the central pipe 15. In other words, the pipe 15 functions both as a filling pipe and an air inlet pipe for the tank 5.

Valve 22 is operatively connected by means of a link 25 with the operating link 19 of the foot accelerator, whereby the amount of vapor supplied to the manifold 17 by means of the present device is regulated in proper proportion to the volume of explosive charges supplied to the manifold 17 from the carburetor 18.

In order to prevent excess moisture from being drawn from the tank 5 along with the additional air supplied to the engine through pipe 15, tank 5 and pipe 21, I provide suitable baffles 26, 26a and 27 within the upper portion of the tank 5 above the liquid level in the latter. As shown, the baffles 26 and 26a are in the nature of frusto-conical rings tapering in a downward direction toward their central openings 28 and secured at their outer margins or edges within the beads 6 of the tank body. The openings 28 are slightly

larger in diameter than that of the pipe 15 so as to surround the latter in uniform restricted spaced relation to the same. Due to the downward taper of the baffles 26 and 26a, any excess moisture which may find its way in the upper portion of tank 5 and be deposited on said baffles will be drained back into the bottom of the tank. The baffle 27 is also of frusto-conical form, but has a small central opening to snugly fit at its inner edge or margin within an annular groove 29 provided in the pipe 15. In this way, the baffle 27 is effectively mounted on the pipe 15, and all of said baffles are preferably split radially as at 30 so that the ends may be separated to expand or contract the baffles and facilitate application of the baffles to the tank and pipe in an obvious manner. Baffle 27 tapers downwardly toward its outer edge so as to also drain moisture toward the bottom of the tank as it drips thereon from the upper baffle 26. In addition, baffle 27 is of a diameter less than that of the body of tank 5 so that its outer edge is in uniform spaced relation to the body of tank 5. The baffles thus form a tortuous path for the air as it passes upwardly in the upper portion of tank 5 after passing through the liquid in the lower portion of said tank and becoming saturated with such liquid. In order to facilitate partial filling of the tank 5 with liquid to the required level directly below the lowermost baffle 26a, a suitable gage may be provided, such as a conventional water gage 31 connected at 32 near its lower end with the lower end of tank 5 and provided at the bottom with the usual drain cock 33 common to water gages.

In operation, the tank 5 is partly filled with liquid introduced through the pipe 15. When the engine 14 is placed in operation, a suction is created in the manifold 17 and pipe 21, which draws air into and through pipe 15, through the liquid in the bottom of tank 5, and then around and past the baffles 26, 26a and 27. This air is drawn from the air space in the upper portion of tank 5 through pipe 21 into the intake manifold 17 for being mixed with the explosive charges which pass through the latter. As the volume of explosive charges supplied to the engine is varied by operation of the usual foot accelerator, the quantity of additional treated air supplied to the manifold 17 by means of the present device

is correspondingly regulated due to operative connection of the valve 22 with the operating link 19 of the accelerator. The gage 31 will readily show when the liquid in the tank 5 needs to be replenished, and sediment or other foreign matter may be readily drained by means of the cock 33. Obviously, the present device may be used for many purposes, such as humidifying additional air supplied to the engine manifold, charging the additional air with gasoline to facilitate starting in cold weather, and charging the additional air with kerosene for removing carbon.

It will be seen that the present device is extremely simple in construction, will operate efficiently, and may be readily and economically manufactured and installed. Minor changes in details of construction illustrated and described are contemplated within the spirit and scope of the invention as claimed.

What I claim as new is:

A device to supply treated air to the intake manifold of an explosive engine by inspiration, comprising a closed tank adapted to be partly filled with liquid, an air intake and filler pipe leading into said tank centrally through the top of the latter and depending to the bottom of said tank below the level of the liquid, baffles in the tank above the level of said liquid alternately carried by the body of the tank and spaced from the air intake and filler pipe and by the air intake and filler pipe and spaced from the body of the tank to provide a tortuous path for air passing upwardly from the liquid, an outlet conduit leading from the top of the tank above said baffles and adapted to be connected to the engine intake manifold, and a control valve in said conduit, the body of the tank and said air intake and filler pipe having annular grooves receiving the adjacent edges of the respective baffles, said baffles being of frusto-conical form and being respectively tapered inwardly and downwardly and outwardly and downwardly to drain excess liquid back to the lower portion of the tank, said baffles being further split radially to permit expansion or contraction thereof and facilitate application of the baffles to the tank and to said air intake and filler pipe.

CHARLES E. ENNIS.