Aug. 10, 1948. D. J. SAUSER ET AL 2,446,612

FUEL TANK

Filed May 16, 1946

Fig. 1.

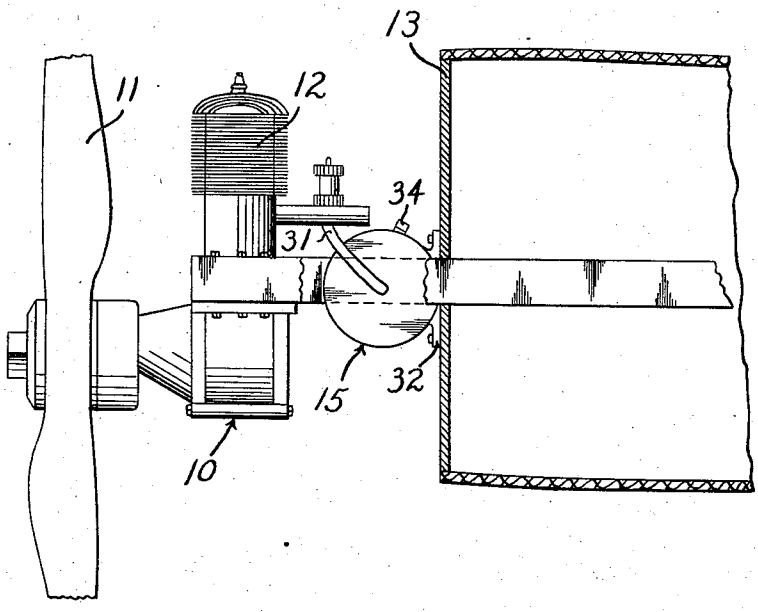


Fig. 2.

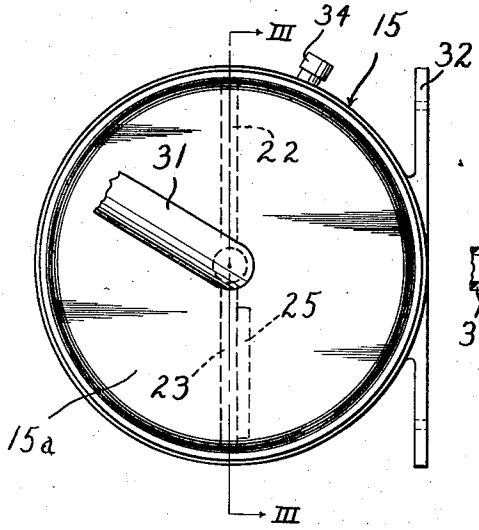
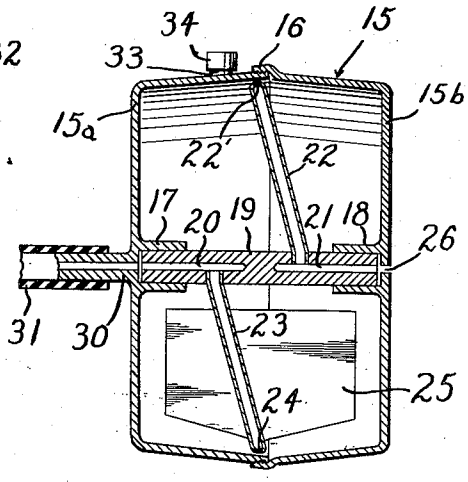


Fig. 3.



Inventors

DONALD J. SAUSER.

JOSEPH A. SAUSER.

The Firm of Charles W. Hills

by Attys

Patented Aug. 10, 1948 2,446,612

UNITED STATES PATENT OFFICE

2,446,612

FUEL TANK

Donald J. Sauser and Joseph A. Sauser,
Evanston, Ill.

Application May 16, 1946, Serial No. 670,059

1 Claim. (Cl. 244—135)

1

This invention relates to tank structures and more particularly to fuel tanks especially adapted for use in tiltable vehicles, such, for example, as aeroplanes. More specifically, the invention is particularly adapted for use in miniature aeroplanes.

In the operation of aeroplanes and especially miniature aeroplanes, the fuel supply to the engine of the plane will be cut off when the plane is in certain positions, such, for example, as when it is making a loop or is in inverted position. Obviously the cutting off of the supply of fuel to the engine affects its performance and might even shut off the engine. The reason for this is that when the tank is tilted or turned up side down the discharge passage of the tank is not in fuel pick-up communication with the tank.

Accordingly we aim to provide in such a tank structure an improved liquid or fuel pick-up and vent device which can swingably move in the tank in response to tilting of the same for enabling effective pick-up of the fuel in the different positions to which the tank is tilted or turned in the gyrations of the plane.

Another object of this invention is to provide an improved but simple fuel pick-up for a tank which can readily adjust itself to different positions of the tank.

Still another object of the invention relates to the provision of a swingable vent element in a tank movable to different positions upon tilting of the tank so as to be maintained uppermost in the tank.

Another object of this invention is to provide a fuel tank for use with internal combustion engines of such construction that the tank will effectively deliver fuel to the engine irrespective of tilting or cocking of the same.

In accordance with the general features of this invention there is provided in a tank structure a liquid containing chamber and a pendulum device in the chamber swingable to different positions in response to tilting of the chamber for picking up liquid from said chamber in each of said different positions.

Another feature of the invention relates to the disposition of the pendulum in a lowermost position in the tank and to the provision of a vent element movable with the shaft and located in an uppermost position; both the pendulum device and the vent element being movable together upon relative movement between the shaft and the tank occasioned by tilting of the tank.

Other objects and features of the invention will more fully appear from the following detailed

2

description taken in connection with the accompanying drawings, and in which

Figure 1 is a fragmentary side view of a miniature aeroplane with the fuselage in section;

Figure 2 is an enlarged plan view of a fuel tank; and

Figure 3 is a cross-sectional view taken on substantially the line III—III of Figure 2, looking in the direction indicated by the arrows.

As shown on the drawings:

We have shown our invention as being applied to a miniature aeroplane, designated generally by the reference character 10 (Fig. 1). It is, of course, to be understood that our invention is not limited to this application, since it may be employed with equal advantage in other uses where a liquid containing chamber is apt to be tilted. For illustration, it might be used with engines of vehicles, such as tanks, boats, lawnmowers and the like.

The engine 10 includes the usual propeller 11, internal combustion engine 12, and fuselage 13. These elements of the structure may be of any conventional or suitable construction.

Positioned between the engine 12 and the fuselage 13 is a tank illustrated generally by the reference character 15, embracing the features of this invention.

This tank 15 includes two dished housing sections 15*a* and 15*b* adapted to be secured together to define a fuel containing chamber. The tank section 15*b* has an enlarged peripherial flange 16 in which the edge of the dished or cup-shaped section 15*a* is suitably secured. The tank 15 may be made of any suitable material, such, for example, as light metal or synthetic plastic. We contemplate that excellent results may be obtained by molding the sections from synthetic plastic material, and thereafter suitably securing them together but subsequent to the introduction of a movable shaft element 19, to be hereinafter described.

The sections 15*a* and 15*b* are provided with internal tubular bosses 17 and 18, respectively, in which the ends of the shaft 19 are journaled. The metal shaft 19 has its ends provided with longitudinally aligned but spaced apart passageway 20 and 21.

Fastened to the shaft 19 is a tubular vent element 22 having its uppermost end provided with a vent hole 22' and having its lowermost end in communication with the passageway 21 in the shaft.

The other passageway 20 in the shaft communicates with the interior of the tubular element 23,

the lowermost end of which is provided with an aperture 24 through which liquid or fuel is adapted to enter for passage upwardly to the passageway 20. The tube 23, in reality, constitutes an integral part of a pendulum device or blade 25 normally located lowermost in the tank and positioned opposite from the vent tube 22.

The vent tube 22 and the shaft passageway 21 are in communication with the external atmosphere by reason of the provision of a hole 26 in the housing section 15b. This hole is aligned with the shaft passageway 21 so that the contents of the tank may be subjected to atmospheric pressure. In practice we find that the end of the shaft 18 can be sufficiently tightly fitted in the boss 18 as to preclude leakage of fuel from the tank.

The other end of the shaft carrying the fuel passageway 20 is aligned with a tubular extension 30 on the outerside of the tank section 15a. In other words, the pendulum device 25 is adapted to pick up fuel or liquid in the tank and deliver it in response to suction through the shaft passage 20 and out of the tubular extension 30 into a flexible connection 31 leading to the carburetor of the engine.

It will be appreciated that the shaft 19, the tubular vent element 20 and the pendulum-like pick-up device 25 are all movable together as a unit upon relative movement between the shaft 19 and the housing of the tank 15. The vane of the pendulum is of sufficient weight that it will always tend to be lowermost in the tank so that upon tilting of the tank, it will swing to a lowermost position and maintain the vent tube 21 uppermost.

In the assembly of the tank, the shaft and its integral elements 22 and 25 is first inserted in the bosses 17 and 18 as the two sections are brought together in telescoping relation. Thereafter, the sections may be suitably fastened together at the flange 16.

One of the sections may be provided with an integral mounting flange 32 by means of which the tank may be rigidly fastened to a part of the aeroplane, such as the fuselage. In addition, one of the sections is provided with a filler nipple 33 normally covered by a removal cup 34. Liquid or fuel may be introduced in the tank through this filler 33 upon removal of the cup.

This tank will feed gasoline to the engine of a plane, model or otherwise, while the plane is in any position including inverted flight, without effecting performance of the engine at any time in going from one position to another.

The all position gas tank is mounted stationary to the structure of plane, model or otherwise and a constant flow of fuel is provided for by the rotating fuel pick-up 23 which operates through a 360° arc.

The inner mechanism on shaft 19 of the all position gas tank, which is the rotating fuel pick-up, rotates by means of a combination pendulum-vane 25, on an axis which allows a full 360° swing and thereby provides a constant fuel pick-up without effecting the performance of the engine no matter what the position of the tank.

The rotating fuel pick-up serves two functions: (1) The lower end 23 to pick-up fuel and bring it out one side of the axis of shaft 19. (2) The upper end or tube 22 to vent the tank; also through the axis of the shaft.

We claim as our invention:

In a fuel tank structure especially adapted for use with aeroplanes, such as miniature aeroplanes and the like, a fuel supply tank where fuel is forced from the tank under atmospheric pressure, a pendulum-like device in the tank containing substantially opposite fuel pick-up and vent openings and being swingably supported in said tank for movement to different positions in response to tilting of the tank and to enable atmospheric pressure to effectively force liquid from the tank in said different positions, said pendulum-like device comprising a shaft journalled in the tank walls and having at its ends axially aligned passageways, one communicating at its inner end with said pick-up opening and the other at its inner end with said vent opening and at its outer end opening into the atmosphere surrounding the tank.

DONALD J. SAUSER.
J. A. SAUSER.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,916,061	Memini	June 27, 1933
1,923,384	Miller	Aug. 22, 1933
2,183,034	Voit et al.	Dec. 12, 1939