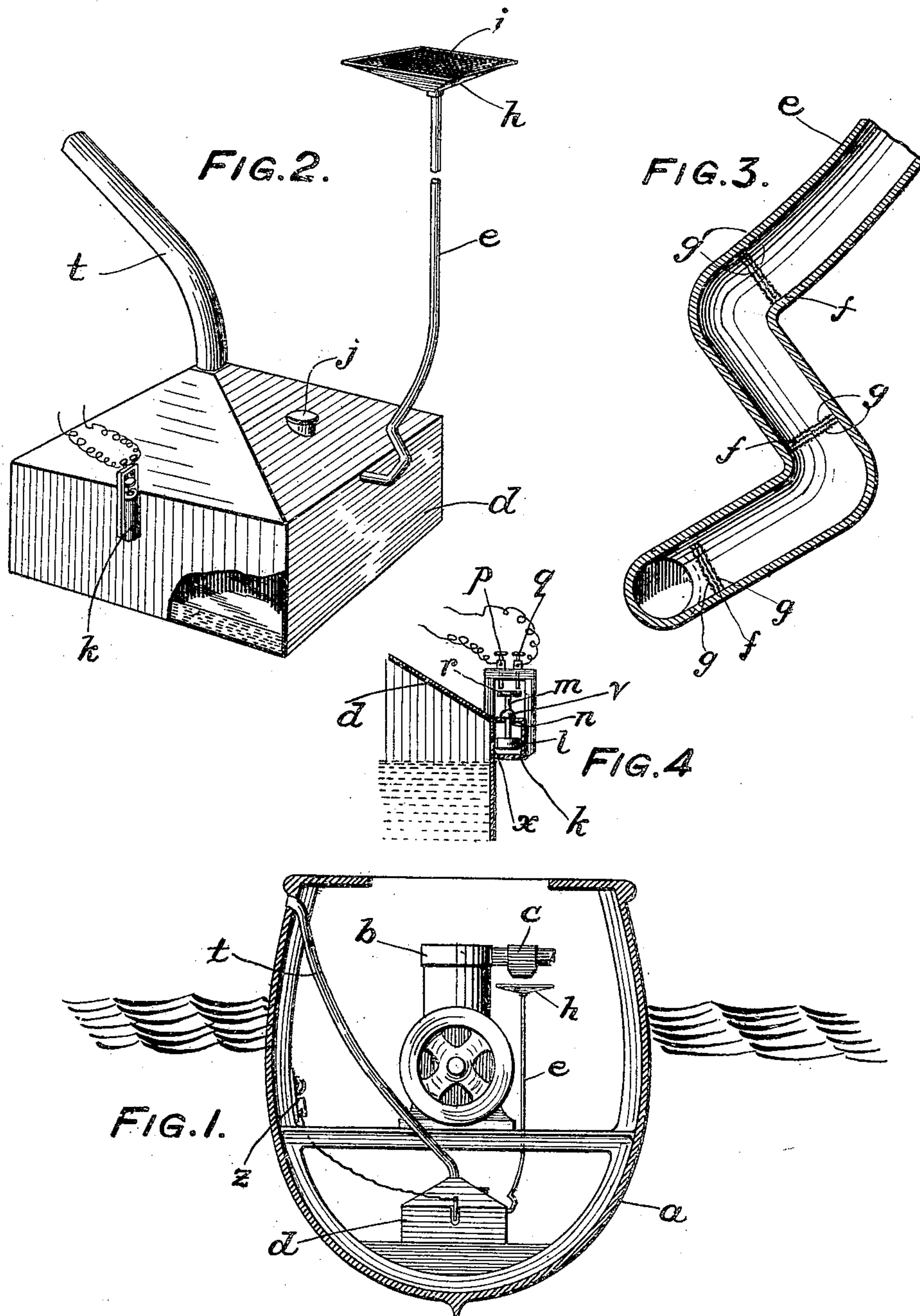


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SAFETY APPARATUS FOR VOLATILE IGNITIBLE LIQUIDS.
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Patented Dec. 13, 1910.



WITNESSES:

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SAFETY APPARATUS FOR VOLATILE IGNITIBLE LIQUIDS.

978,459.

Specification of Letters Patent.

Patented Dec. 13, 1910.

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To all whom it may concern:

Be it known that I, EDWARD R. LAUGHLIN, a citizen of the United States, residing at Ardmore, county of Montgomery, and State of Pennsylvania, have invented a new and useful Improvement in Safety Apparatus for Volatile Ignitable Liquids, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, which form a part of this specification.

My invention is adapted for use with motors driven by explosive gases produced from volatile liquids and particularly with what are termed motor-boats which are operated by gasoline engines. With such boats, for instance, leakage of the gasoline, especially from the carbureter, frequently occurs. The accumulation of such leakage of gasoline may vaporize and become ignited, causing the destruction of the engine and boat.

My invention has for its object the production of a receptacle provided with an inlet pipe, which pipe extends from a point of leakage and which is obstructed, so that while it allows the liquid to pass into the receptacle it resists the return therethrough of any gas formed in the receptacle. Preferably this pipe is bent adjacent to the receptacle forming a gas trap. From such receptacle an unobstructed vent pipe leads to the atmosphere. Thus any leakage gasoline will be safely conveyed through such inlet pipe to such receptacle, and gas generated in said receptacle will be prevented from passing back through said inlet pipe and will be free to pass through said vent pipe.

Speaking generally, I provide a receptacle which is air-tight and preferably provided with a frusto conical upper portion. Into this receptacle extends an inlet pipe which is provided with right angle turns and adjacent to the bend on the end farthest from the receptacle are placed wire gauze screens of fine mesh, preferably say 40,000 mesh to the square inch. The outer end of this pipe has a funnel protected by wire gauze of somewhat coarse mesh. From the upper portion of the receptacle extends an unobstructed vent pipe in such manner as to offer as little resistance as possible to the passage of gases. The apparatus is located, say in the boat, in such position that it is well be-

low any point from which leakages are to be taken care of. The inlet pipe is of such length that the funnel will be below and adjacent to the point of probable leakage, say the carbureter. The vent pipe extends from the receptacle to the outer air.

Generically expressed, my invention consists in connecting the receptacle with the point of leakage by a pipe offering resistance to the back flow of gas generated or produced in the receptacle, said pipe being used to convey the leakage gasoline to the receptacle. There being also an unobstructed passage or pipe from the receptacle which may lead to the atmosphere outside of the boat. Thus free access for leakage to the receptacle is obtained and any gas generated in the receptacle will pass out through the open and unobstructed path through the vent rather than to return through the inlet pipe.

I will now describe the embodiment of my invention illustrated in the accompanying drawings.

In the drawings: Figure 1 is a section through hull of a boat containing an embodiment of the invention. Fig. 2 is a detail perspective view of receptacle and inlet and outlet pipes. Fig. 3 is an enlarged detail sectional view of part of inlet pipe. Fig. 4 is a section of a portion of receptacle showing indicating mechanism.

a is the boat containing the engine *b* operated by explosive gas obtained from a volatile liquid.

c is the carbureter for forming the explosive gas from the gas of the gaseous liquid.

d is a receptacle placed at some suitable point low in the boat. This lower portion of this receptacle is rectangular in shape and has a conical upper portion.

e is an inlet pipe to said receptacle. This pipe *e* has the right angle turns, as shown in Fig. 3. Adjacent to the right angle turns are placed the wire mesh screens *f* of fine mesh, backed up, for protection of the fine mesh screen, by the wire mesh screens *g* of coarser mesh. The outer end of this pipe *e* terminates in the funnel *h* covered with wire mesh *i*. This wire mesh need not be fine mesh as its purpose is to prevent foreign matter passing into the pipe and being carried to the receptacle and clogging fine mesh. The pipe *e* is of such length that the funnel

h is beneath and adjacent to the carbureter c . Any leakage from the carbureter is caught by the funnel and carried by the pipe to the receptacle d . From the upper portion of the receptacle d extends the vent pipe t which is carried upward, on a slight curve, to a point above the water level and through the side of the boat to the atmosphere exterior of the boat. The outer end of this vent pipe presumably should be covered with a screen of wire mesh to prevent foreign matter passing and to prevent possibility of back firing.

j is a cap, closing an orifice in the receptacle d , which may be opened to remove the accumulated liquid from the receptacle.

In order to prevent the liquid accumulating in the receptacle to such an extent as to rise to a height sufficient to force it back in the pipe e , I provide the chamber k connected with the reservoir by the passage x , which is at a point in the receptacle above which the liquid therein should not rise. This passage x should be covered on the receptacle end by a fine wire gauze screen, preferably, say 40,000 mesh to the square inch, and backed up for protection by a heavier wire gauze. In this chamber is the float l having the guiding stem m guided in the orifice n in the top of chamber k .

p , q , are contacts from which wires extend respectively to opposite poles of a current supply. In this circuit is included a signal z , Fig. 1. The contacts are placed in line with and slightly above the normal position of the float. The normal position of the float being, as shown in Fig. 4, so that its lower surface is in line with the opening to the receptacle d . As soon as the liquid enters through this opening it moves the float and at once, the disk r , which is of conductive material, connects the contacts or terminals and the circuit is closed and signal given. This is valuable in cases where the boat is idle for a long time or the leak is abnormally large. In either case the signal showing the receptacle full to the determined point indicates that these conditions should be looked into and rectified.

The stem m is provided with the hood v which, in the normal position of the valve, makes a gas-tight joint with the orifice n . Thus this orifice n is gas-closed except for the infinitesimal time necessary for the float to rise to connect the contacts. When this indication takes place the cap j may be removed and the liquid withdrawn from the receptacle.

The operation is as before described. Any liquid which leaks will pass through the inlet pipe into the receptacle. Any gas forming in the receptacle will have less difficulty in passing out the free vent pipe than through the obstructed and right angled

inlet pipe. Therefore such gas will pass freely off through the vent pipe to the air and there is no danger of any gas passing back through the inlet pipe and catching fire. Thus all danger to the boat machinery or occupants by fire is obviated.

I do not intend to limit my invention to use in motor boats as it is adapted for use not only in boats using volatile ignitable liquids for propulsion but for all vehicles or purposes in which such liquids are used.

Having now fully described my invention, what I claim and desire to protect by Letters Patent is:

1. In an apparatus for the purpose described, in combination, a receptacle, an inlet passage adapted to allow liquid to pass to the receptacle but restricted against the return passage of gas and an unobstructed gas outlet passage from the receptacle.

2. In an apparatus for the purpose described, in combination, a receptacle, an inlet passage adapted to allow liquid to pass to the receptacle but restricted against the return passage of gas and an unobstructed gas outlet passage from the receptacle to the atmosphere.

3. In an apparatus of the character described, in combination, a receptacle, an inlet pipe, provided with right angle turns, opening into the receptacle, fine wire mesh screen or screens in said inlet pipe, and an unobstructed vent pipe leading from said receptacle.

4. In an apparatus of the character described, in combination, a receptacle, an inlet pipe, provided with right angle turns, opening into the receptacle, fine wire mesh screens in said inlet pipe adjacent to said right angle turns in said pipe, and an unobstructed vent pipe leading from said receptacle.

5. In an apparatus of the character described, in combination, a receptacle, an inlet pipe, provided with right angle turns, opening into the receptacle, fine wire mesh screen or screens in said inlet pipe, a funnel at the other end of said pipe and an unobstructed vent pipe leading from said receptacle.

6. In an apparatus of the character described, in combination, a receptacle, an inlet pipe, provided with right angle turns, opening into the receptacle, fine wire mesh screens in said inlet pipe adjacent to said right angle turns in said pipe, a funnel at the other end of said pipe and an unobstructed vent pipe leading from said receptacle.

7. In an apparatus for the purpose described, in combination, a receptacle, an inlet passage to the receptacle restricted against the return passage of gas, an unobstructed gas outlet passage from the receptacle, and means to indicate when the liquid

in the receptacle rises sufficiently to cause it to overcome the resistance of the inlet pipe.

5 8. In an apparatus of the character described, in combination, a receptacle, an inlet pipe, provided with right angle turns, opening into the receptacle, an unobstructed vent pipe leading from said receptacle, and means to indicate when the liquid in the
10 receptacle rises above the right angle turns.

9. In a boat operated by a volatile liquid explosive, in combination, a receptacle placed at a low point in the boat, an inlet
15 passage leading from a point of leakage to the receptacle, said passage being obstructed against the return passage of gas and an unobstructed gas passage from the receptacle leading to the air outside of the boat.

20 10. In a boat operated by a volatile liquid explosive, in combination, a receptacle placed at a low point in the boat, an inlet passage leading from a point of leakage to

the receptacle, said passage being provided with right angle turns, and an unobstructed gas passage from the receptacle leading to
25 the air outside of the boat.

11. In a boat operated by a volatile liquid explosive, in combination, a receptacle placed at a low point in the boat, an inlet
30 passage leading from a point of leakage to the receptacle, said passage being provided with right angle turns, wire screens of fine mesh in said passage adjacent to said right angle turns, and an unobstructed gas pas-
35 sage from the receptacle leading to the air outside of the boat.

In testimony of which invention, I have hereunto set my hand, at Philadelphia, on this 29th day of January, 1909.

EDWARD R. LAUGHLIN.

Witnesses:

M. M. HAMILTON,
E. E. WALL.