

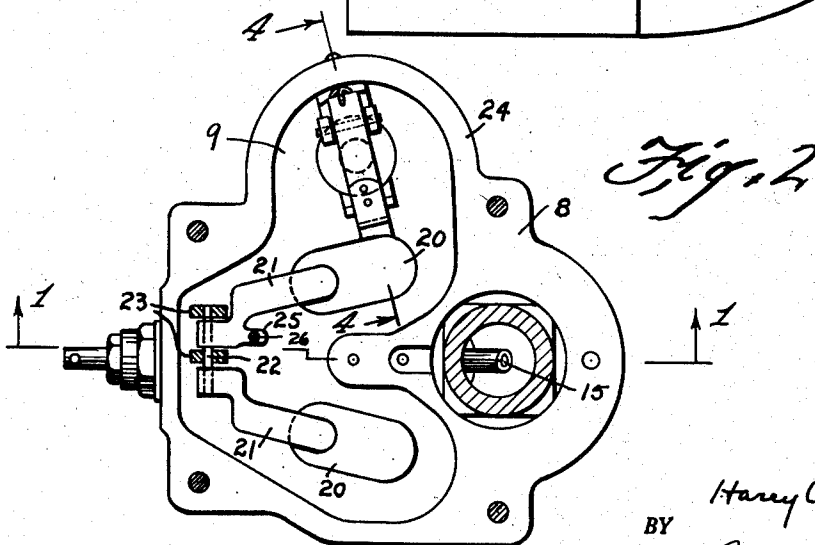
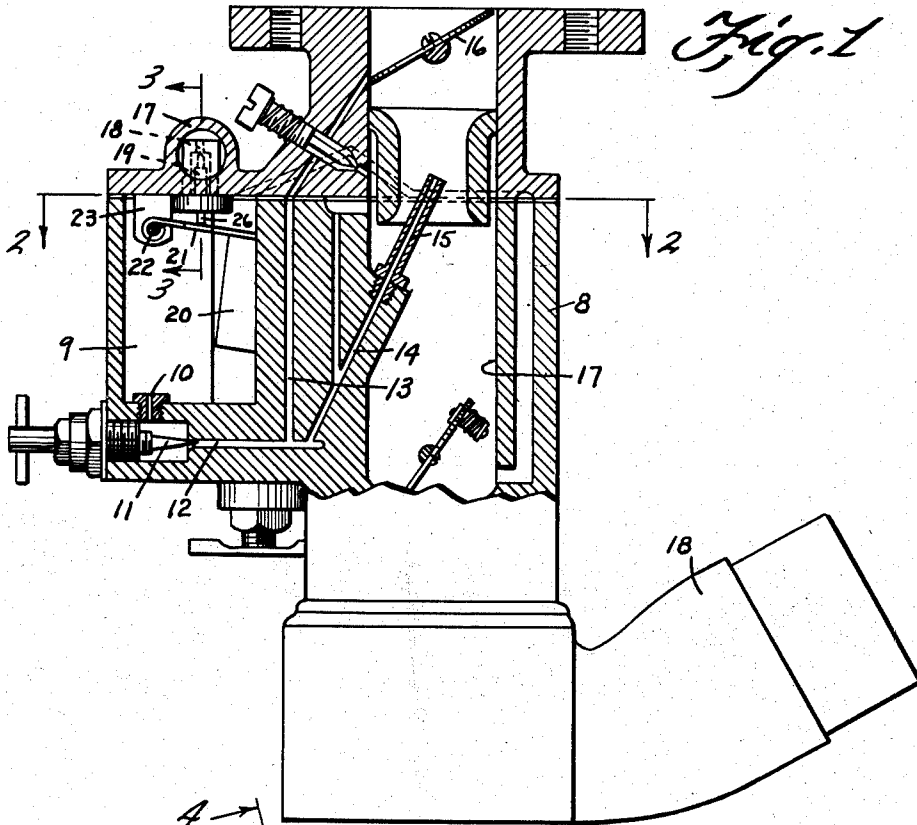
Aug. 6, 1957

H. C. STEARNS
CARBURETOR

2,801,623

Filed Feb. 10, 1956

2 Sheets-Sheet 1



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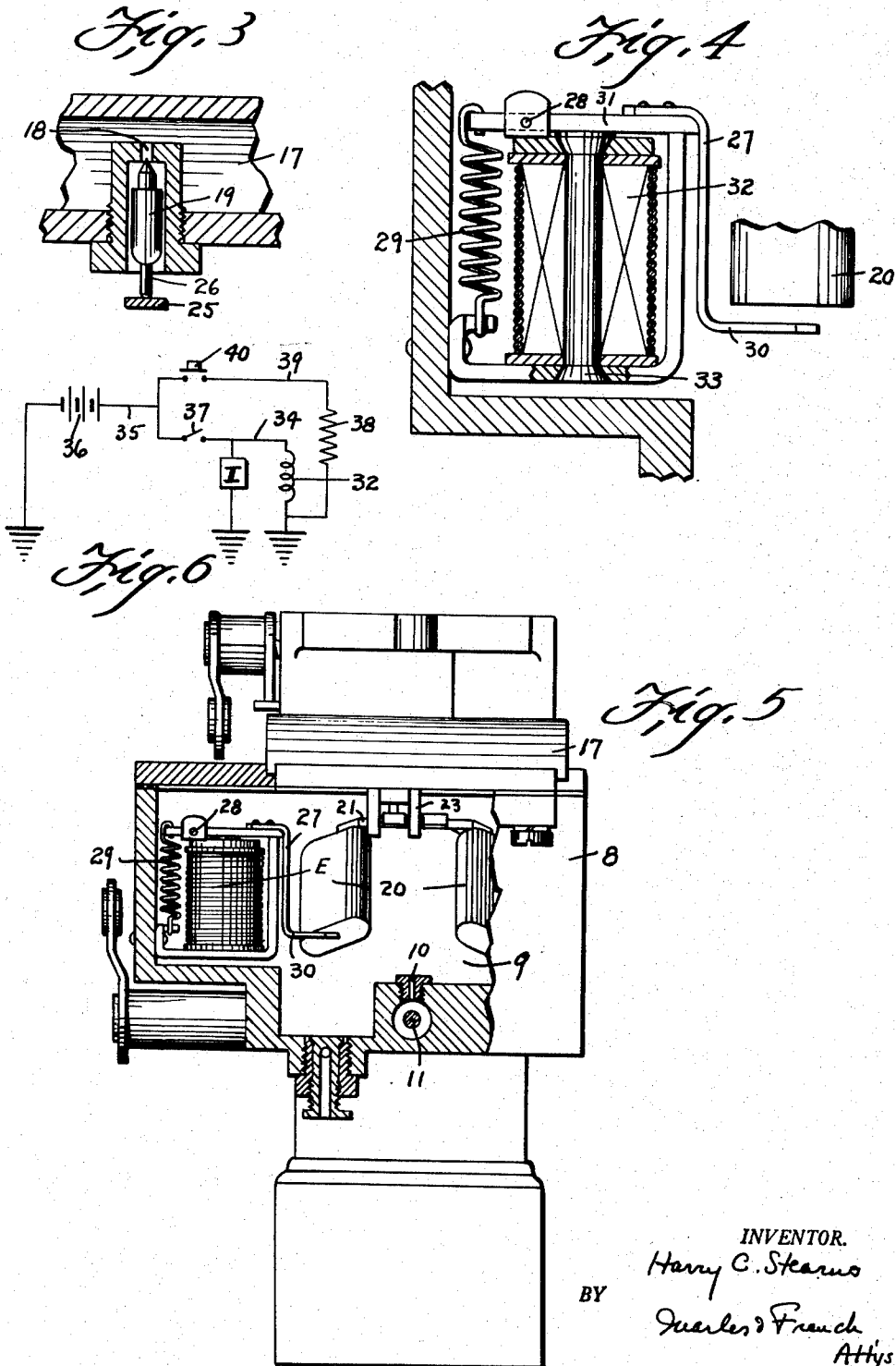
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CARBURETOR

Harry C. Stearns, Glen Ellyn, Ill.

Application February 10, 1956, Serial No. 564,794

8 Claims. (Cl. 123—119)

The invention relates to carburetors.

The carburetors of many spark ignition internal combustion engines including many agricultural and industrial tractors are provided with gravity fuel supply arrangements which apply continuous pressure to float controlled valves. Because such equipment is used in environments where there may be flying chaff or other loose material, a small piece of foreign matter which has worked its way into the fuel system may become lodged between the float needle valve and its seat when the engine is stopped. When this occurs, the contents of the fuel tank may continue to flow into the bowl and overflowing drop to the pavement. If the tractor is parked in a barn, particularly a barn or building containing combustibles such as hay, a serious fire hazard is created. While a fuel shut off valve is usually provided on the strainer bowl ahead of the carburetor, the operator may easily forget to close such a valve or may negligently ignore it. Also sometimes a leak may develop in the float allowing fuel to enter the float and thus weigh it down and impair its buoyancy to an extent that it fails to exert enough force on the fuel valve to close it tightly when the engine is stopped so that the contents of the fuel tank may continue to flow into the bowl and overflow therefrom to create the fire hazard above described.

In view of the above problem, an object of the present invention is to provide means for positively augmenting the closing force of the float controlled valve of a carburetor when the ignition switch of the engine is thrown to stop the engine without other dependence upon intervention of a human operator and which automatically releases the valve for control by the float when the engine is started.

A further object of the invention is to provide a magnetically controlled valve controlled by the ignition switch of the engine so that any flow of fuel from the fuel supply to the engine is stopped when the ignition switch is opened.

A further object of the invention is to provide a heating means for the fuel in the float bowl of a carburetor associated with the float valve lock mechanism for heating the fuel to aid in starting the engine in cold weather.

The invention further consists in the several features hereinafter described and more particularly defined by claims at the conclusion hereof.

In the drawings:

Fig. 1 is a side elevation view of a carburetor embodying the invention, parts being broken away and parts being shown in a section taken along the line 1—1 of Fig. 2;

Fig. 2 is a horizontal sectional view taken on the line 2—2 of Fig. 1;

Fig. 3 is a detailed vertical sectional view taken on the line 3—3 of Fig. 1;

Fig. 4 is a detailed vertical sectional view taken on the line 4—4 of Fig. 2;

Fig. 5 is a side elevation view, parts being broken away and parts being shown in section;

Fig. 6 is a circuit diagram.

Referring to Fig. 1, the carburetor shown therein is the same as far as the fuel mixing and mixture controls are concerned as that shown and more particularly described in my copending application Serial No. 518,753, filed June 29, 1955, and now abandoned, to which reference may be had for a detailed description thereof.

The present invention is concerned with the float valve so that only those parts affected by this valve will be described here.

Referring to Figs. 1 and 5, the housing 8 of the carburetor has a float chamber 9 formed therein from which fuel flows by gravity through outlet 10, past an adjustable flow control valve 11 to a passage 12 connected with passages 13 and 14. A nozzle 15 forms the outlet of the passage 14. The passage 13 leads to the upper portion of the carburetor adjacent the throttle valve 16. A fuel inlet conduit 17 has an outlet 18 controlled by a float controlled valve 19. If when the engine is stopped, the float controlled valve 19 does not shut off the supply of fuel to the chamber 9 because of foreign matter acting to prevent seating of this valve, the float chamber will become flooded with fuel which will leak out through the passages above described into the passage 17 of the carburetor and out through the air inlet portion 18 onto the floor of a building in which the tractor having an engine equipped with this gravity feed carburetor may be parked presenting a serious fire hazard. In order to overcome this possibility, I have provided the hereinafter described means for exerting a positive closing pressure on the float controlled valve 19 of the carburetor when the engine is stopped.

The carburetor shown herein is provided with a pair of floats 20, each float connected by a supporting arm 21 to a shaft 22 pivotally mounted in bearing brackets 23 depending from the top section 24 of the carburetor housing. One of the arms 21 has a projection 25 alined with the lower end of the stem 26 of the valve 19 so that as the float on this arm acts to raise the same, the projection 25 will engage the stem 26 of the valve to close the valve when the desired fuel level in the float chamber 9 has been reached. There are limits to the amount of closing pressure that can be exerted by the float, and such pressures may not be sufficient to dislodge some small particle that may interfere with the full closing of the valve 19 so that leakage as above described may occur when the carburetor is not in operation.

In order to insure a positive closure of the valve 19 when the engine has stopped, I have provided as shown in Figs. 4 and 5 a lever 27 pivotally supported intermediate its ends on a pin 28 and normally urged by a spring 29 connected to one of its ends to swing its other end 30 upwardly against the bottom of the float 20 having the arm 21 provided with the projection 25 engageable with the valve to exert an upward pressure on the float and arm of sufficient force to close the valve 19 when the engine is stopped.

To relieve the operator of any responsibility for the action of the above referred to valve closing means, the spring 29 acting through the lever 27 immediately exerts a valve closing force as soon as the engine stops, and to prevent these parts exercising their closing action when the engine is started and the carburetor is called upon to supply fuel thereto, a part 31 of the lever 27 is formed as the armature of an iron clad electromagnet E having an energizing coil 32 and a pole piece 33 in attractive relation with said armature, these parts being shown in operative position in Fig. 4 holding the end 30 of the lever 27, against the pressure of the spring 29, away from the float, the above named parts being mounted in the

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float chamber 9 and supported therein by a suitable connection with a wall of said chamber.

The coil 32 is in a branch circuit 34 connected by a conductor 35 with a current supply battery 36, this branch circuit also being connected to the ignition system designated generally by I and including the usual spark coil, passage of current to I and the coil 32 being controlled by what is generally termed the ignition control switch 37 so that as soon as the engine is started and the switch 37 closed, current will flow to the ignition system and to the coil 32. Energizing the coil 32 acts to move the lever 27 to the release position in Fig. 4 so that the normal operation of the float and the valve 19 is not interfered with in furnishing fuel to the float chamber 9.

Various other forms of connection between the electromagnetically released spring actuated means for holding the valve 19 closed when the carburetor is not in operation may be used without departing from the spirit of this invention.

In order to facilitate cold weather starting I provide a resistance coil 38 surrounding the energizing coil 32 and adapted to receive its electrical heating energy through a branch circuit 39 preferably separately controlled by an operator controlled switch 40. The coil 38, through its inductive effect, may supplement the action of the coil 32 but is only on for a brief interval to facilitate starting by supplying heat to the fuel in the float chamber 9 so that it will readily vaporize the mix with the air passing through the carburetor.

I desire it to be understood that this invention is not to be limited to any particular form or arrangement of parts except in so far as such limitations are included in the claims.

What I claim as my invention is:

1. In a carburetor having a float chamber supplied with fuel under continuous head, the combination of a fuel valve controlling the flow of said fuel to said float chamber, means for positively closing said fuel valve when the carburetor is not in operation, and means operable as an incident to the starting of the engine supplied with fuel by the carburetor for incapacitating said valve closing means.

2. In a carburetor having a float chamber supplied with fuel under continuous head, the combination of a float controlled fuel valve controlling the supply of said fuel to said float chamber, spring operated means acting auto-

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matically to positively close said valve when the carburetor is not in operation, and means operable as an incident to the starting of the engine supplied with fuel by the carburetor for incapacitating said spring operated means.

3. The structure as defined in claim 1, wherein the means for incapacitating said valve closing means is an electromagnet rendered operative when current is supplied to the ignition system of the engine.

4. In a carburetor having a float chamber supplied with fuel under continuous head, the combination of a float, a fuel valve controlled by said float and normally controlling the supply of fuel to said float chamber, auxiliary means augmenting the closing action of said float on said valve to insure closing of said valve when the carburetor is not in operation, and means for incapacitating said auxiliary means when the carburetor is functioning.

5. In a carburetor having a float chamber supplied with fuel under continuous head, the combination of a float controlled fuel valve controlling the supply of fuel to said float chamber, a spring energized lever operatively connected to said fuel valve to close the same when the carburetor is not in operation, an electromagnet for releasing said lever when the carburetor is operating, and means for supplying current to said electromagnet operable when current is supplied to the ignition system of the engine supplied with fuel by said carburetor.

6. In a carburetor as defined in claim 5, wherein the electromagnet has its energizing coil mounted in said float chamber and a fuel heating coil surrounds said energizing coil.

7. The combination with an engine carburetor having a float bowl, of an ignition system for the engine including an ignition control switch and valve means to prevent the flow of fuel to said bowl when said ignition switch is in the off position.

8. In a fuel supply for an internal combustion engine, the combination of electromagnetically controlled means for shutting off the supply of fuel to the engine, and an ignition system including an ignition switch and an energizing circuit for said electromagnetically controlled means controlled by said switch.

No references cited.