Oct. 30, 1923. 1,472,246

P. DANIEL

THROTTLE HEATER

Filed Aug. 26, 1920

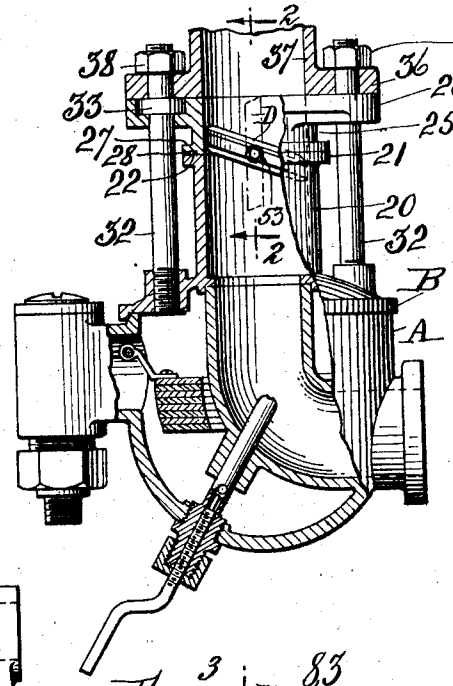


Fig. 1

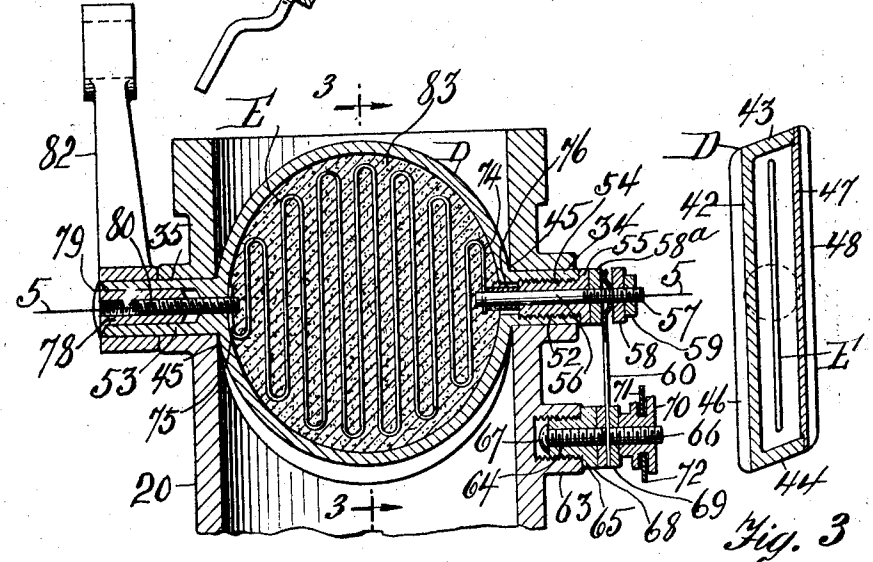


Fig. 3

Fig. 2

Fig 4

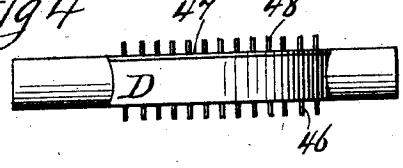
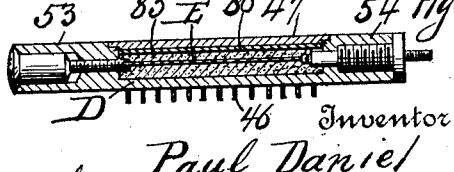


Fig 5



Inventor

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By his Attorney A. N. de Bonneville

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UNITED STATES PATENT OFFICE.

PAUL DANIEL, OF BOUNDBROOK, NEW JERSEY.

THROTTLE HEATER.

Application filed August 26, 1920. Serial No. 406,068.

To all whom it may concern:

Be it known that I, PAUL DANIEL, citizen of the Republic of France, and resident of Boundbrook, in the county of Middlesex and State of New Jersey, have invented certain new and useful Improvements in a Throttle Heater, of which the following is a specification.

This invention relates to a throttle heater by means of which the gasoline or other liquid fuel discharged from the spray nozzle of any carbureter is quickly vaporized, to secure the easy starting and efficient operation of the engine with which the heater is employed. The organization of the invention comprises a casing which is substituted for the butterfly valve of the carbureter of the engine. The said casing with its cover is of a width not greater than the diameter of the hub of the butterfly valve of the carbureter for which it is substituted. A resistance coil in the casing is imbedded in non-electric conducting material, but which will conduct heat. The said material holds the coil firmly in place. An electric current is transmitted to the coil which is thereby heated. The heat of the coil is transmitted to the walls of the casing and cover which in turn heats the mixture in the carbureter as it flows into the manifold of the engine. When the throttle heater is placed in its closed position, the heat generated in the carbureter will be confined therein and not escape into the manifold.

In the accompanying drawings Fig. 1 represents a part vertical axial section and elevation of a carbureter with the heater shown in full lines in its closed position and in dotted lines in its open position; Fig. 2 shows a section of Fig. 1 on the line 2, 2 with the throttle heater swung to its open position; Fig. 3 is an enlarged section of the throttle heater on the line 3, 3 of Fig. 3; Fig. 4 shows an enlarged front view of the main portion of the heater with its cover and Fig. 5 represents a section of Fig. 2 somewhat reduced on the line 5, 5.

A carbureter is designated in its entirety by the letter A and has connected thereto the bonnet B with the discharge barrel 20 having the upper flange 21. An annular projection 22 is formed with the flange 21. An upper barrel 25 has formed at its upper end the flange 26 and at its lower end the flange 27 with the annular recess 28 that locks with the annular projection 22. Standing bolts 32 at their lower ends are in threaded engagement with the cap B and at their upper ends have formed therewith the flanges 33. At the junction of the barrels 20 and 25 are formed the journal bearings 34 and 35 one portion of each journal bearing is connected to the barrel 20 and its other portion is connected to the barrel 25. Upon the flange 26 is located the flange 36 of a manifold 37 of a hydro-carbon engine. Nuts 38 clamp the flange 36 to the flange 26 and the joint between the barrels 20 and 25 is sealed by means of the bolts 32 and their flanges 33.

The throttle heater designated in its entirety by the letter D, comprises the oval casing having the main wall 42 with the end circumferential walls 43 and 44 that incline respectively to the main wall 42. The walls 43 and 44 join with the portions 45 that are perpendicular to the wall 42. The walls of the said casing engage with the walls of the barrels 20 and 25 when in their inclined closed position, as shown in Fig. 1. Fins 46 extend from the outer face of the wall 42. A snap cover 47 with the fins 48 similar to the fins 46 is detachably locked to the oval casing. The heater D with its cover functions as a butterfly valve for the carbureter and closes the passage in the barrels 20 and 25 when in its closed position. Tubular trunnions 52 and 53 are formed with the casing of the heater D and are respectively supported in the journal bearings 34 and 35. A threaded plug 54 of electric insulating material with the head 55 is in threaded engagement with the interior of the trunnion 52. A rod 56 threaded at one end 57 extends through the plug 54 and coaxial therewith. Nuts 58, 58[a] on the threaded end 57 clamp between them one end of the spring contact electric bar 60. A lock nut 59 locks with the nut 58. An interiorly threaded boss 63 is formed with the barrel 20 below the journal bearing 34. A threaded plug 64 of electric insulating material with the head 65 is in threaded engagement with the boss 63. A screw 66 with the head 67 extends axially through the plug 64. The screw 66 extends through an opening in the lower end of the contact bar 60. A pair of nuts 68 and 69 clamp the lower end of the bar 60 in place. A binding post cap 70 is in threaded engagement with the screw 66. The snap jaws 71, 72

of a wire (not shown) for electric current detachably lock with the cap 70.

In the heater D is located a resistance coil designated in its entirety by the letter E and is shown with the end members 74 and 75. The member 74 extends through an opening in the rod 56. A separator sleeve 76 encircles the rod 56 and bears between the member 74 of the coil E and the accompanying end face of the plug 54, whereby the member 74 is securely clamped in place. In the trunnion 53 is located the tubular nut 78 with the button head 79. A rod 80 is in threaded engagement with the nut 78. The member 75 of the coil E extends through an opening in the rod 80 and said member bears against the adjacent inner face of the wall of the heater D and is thereby kept in place. The connection of the members 74 and 75 of the coil E with the rods 56 and 80 allows the easy detachment of said coil for repairs or replacement. The usual operating arm 82 of the butterfly valve of the carbureter is fastened to the trunnion 53. A heat conducting and electric non-conducting material 83 in the heater D has the coil E embedded therein. The material 83 is introduced in the heater D in liquid or plastic form, and upon solidifying encloses the coil E and prevents it vibrating.

In the operation of the throttle heater electic current is furnished by the wire of the snap jaws 71, 72. The electric current flows through the contact bar 60, thence through the rod 56 and then into the heating coil E after which it is grounded. The heat of the coil E is transmitted by the material 83, the casing of the heater D and its fins 45, the cover 46 and its fins 47 into the fuel or gasoline mixture as it flows from the carbureter. The heater transmits the heat units of the resistance coil E to the fuel mixture at a temperature that is much less than the temperature of said coil. This prevents preignition in the manifold 37. The coil E is securely embedded in the material 83 and is prevented entering the manifold in case of accidental breakage.

This form of the throttle heater is preferably used for engines of large size and which use a low grade of fuel or gasoline. By means of this form of heater the heat from the coil E is directed both into the carbureter and into the manifold of the engine.

In the modication shown in Fig. 5 the heater D is shown with its fins 46, trunnions 53 and 54, heating coil E, electric insulating material 83, and their appurtenances as already described. The snap cover 47 in this modification is devoid of fins and a sheet of asbestos 86 is placed over the insulating material 83. This modification is used for small engines that use a high grade of gasoline and with it the heat generated in the coil E is to a great extent directed into the lower portion of the carbureter.

Having described my invention what I desire to secure by Letters Patent and claim is:—

1. In a heater of the character described the combination of a casing, trunnions for the casing to adapt it to function as a throttle valve, a heat conducting and electric non-conducting material in the casing, a heating coil embedded in and firmly held in said material and means to conduct an electric current to the coil.

2. In combination, a carbureter, a discharge barrel for the carbureter, a heater in the barrel comprising a casing adapted to close the passage in said barrel when swung in proper position therefor and adapted to be swung to open said passage, a heat conducting and electric non-conducting material in the casing, a heating coil imbedded in and firmly held in said material and means to conduct an electric current to said coil.

3. In combination, a carbureter, a discharge barrel for the carbureter having journal bearings formed therewith, an oval shaped casing in the barrel, trunnions extending from the casing supported in said journal bearings, a detachable cover for said casing, a heat conducting and electric non-conducting material in the casing, a heating coil imbedded in and firmly held in said material, means to conduct an electric current through one of said trunnions to said coil and an arm connected to the other trunnion to swing said casing.

4. The combination in a throttle heater of a casing, a pair of tubular trunnions extending from opposite sides of the casing, a threaded plug of insulating material in engagement with one of the trunnions, a rod with an opening in one end and a thread at the other end extending through the plug, a spring contact bar connected to the threaded end of the rod, a heating coil with a pair of end members in the casing, one of said members extending through the opening in said rod, a separator sleeve on the rod between said end member that extends through the rod and the threaded plug, a tubular nut in the other trunnion of the casing, a rod with an opening in one end in the tubular nut and in threaded engagement therewith, the other end member of the coil extending through the latter opening and detachably clamped by the latter rod against the inside face of the wall of the casing and means to conduct an electric current to the coil.

5. In a throttle heater the combination of a casing having a pair of tubular turnnions extending from opposite sides thereof, non-electric conducting material in the casing, a heating coil with a pair of end members in the casing imbedded in said material,

rods adjustably located in the trunnions and detachably connected to said end members of the coil and means connected to one of said rods for a source of electric current.

6. In a throttle heater the combination of a casing having fins extending therefrom, a cover for the casing having fins extending therefrom, a heating coil within the casing and means to conduct an electric current to the coil.

7. In a carbureter the combination of a discharge barrel, a second barrel detachably clamped to the first barrel, a pair of journal bearings formed at the junction of the barrels with one portion of each bearing connected to one barrel and its other portion connected to the other barrel, a throttle heater with a pair of trunnions, said trunnions supported in said journal bearings, an electric insulating material in the heater, a heating coil imbedded in said material, means to conduct an electric current to said coil through one of said trunnions and an arm connected to the other trunnion.

8. In a carbureter the combination of a discharge barrel, a pair of journal bearings for the barrel, a throttle heater with a pair of tubular trunnions in the barrel, said trunnions journaled in the journal bearings, a rod in each trunnion, electric insulating means in one of said trunnions insulating its rod from the trunnion, a coil in the heater having end members, one of said members connected to one rod and the other member connected to the other rod, a spring electric contact bar connected to the insulated rod and an arm connected to the trunnion containing the other rod to swing the throttle heater, said heater adapted to function as a valve in the said discharge barrel.

9. In a throttle heater the combination of a casing adapted to function as a valve, a heating coil within the casing, a sheet of non-heat conducting material on one side of the coil and means to conduct an electric current to the coil.

10. In a throttle heater the combination of a casing adapted to function as a valve, a cover for the casing, non-electric conducting material in the casing, a heating coil imbedded in said material, a sheet of non-heat conducting material below the cover of the casing and means to conduct an electric current to said coil.

11. In a throttle heater the combination of a casing adapted to function as a valve, fins extending from the casing, a detachable cover for the casing, non-electric conducting material in the casing, a heating coil imbedded in the material in the casing, a sheet of non-heat conducting material below the cover of the casing, means to conduct an electric current to said coil and means to swing the heater.

Signed at the borough of Manhattan, city of New York in the county of New York and State of New York, this 25th day of August A. D. 1920.

PAUL DANIEL.