

Sept. 6, 1938.

J. DRISCOLL

2,129,571

CARBURETOR HEATER FOR INTERNAL COMBUSTION ENGINES

Filed June 10, 1936

2 Sheets-Sheet 1

Fig. 1

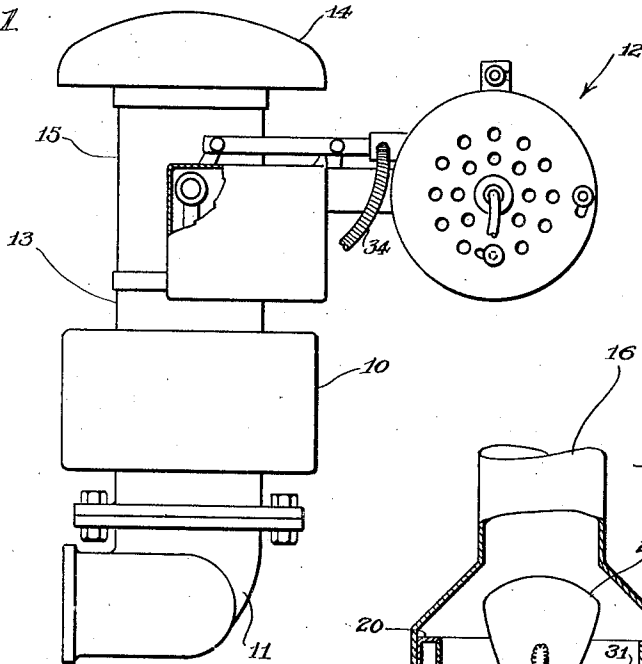


Fig. 5

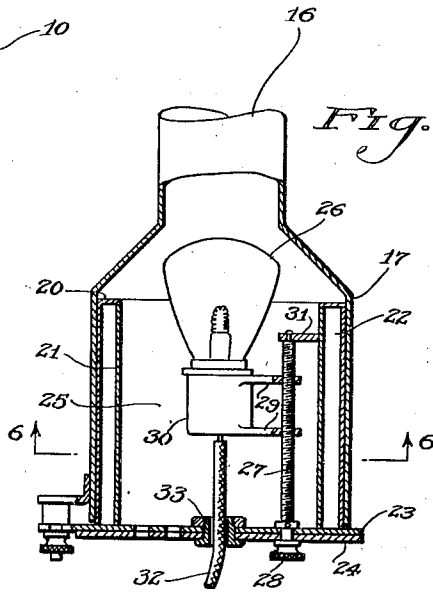


Fig. 7

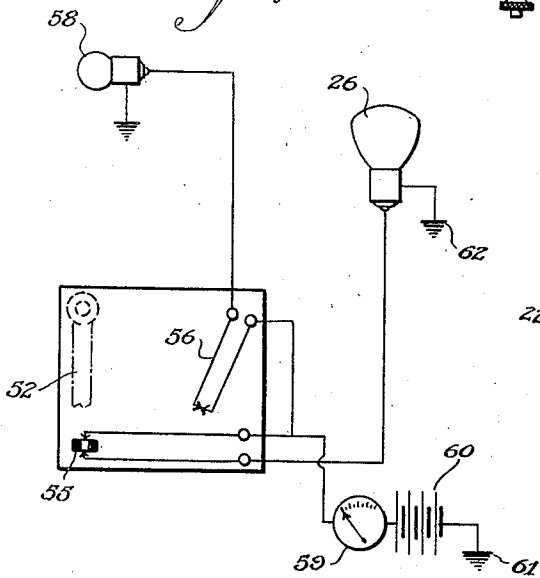
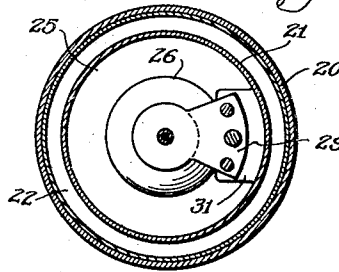


Fig. 6



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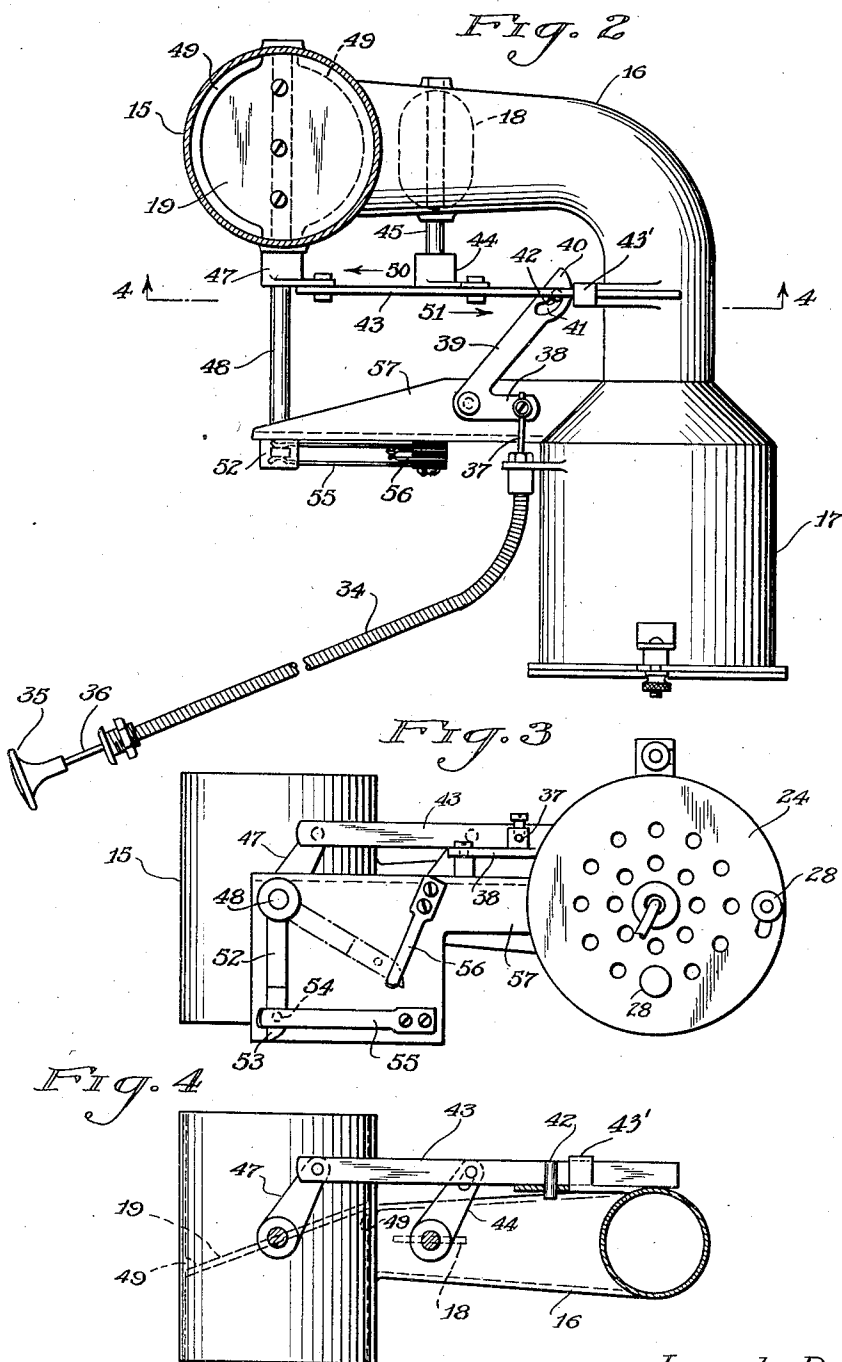
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CARBURETOR HEATER FOR INTERNAL COMBUSTION ENGINES

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2 Sheets-Sheet 2



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CARBURETOR HEATER FOR INTERNAL COMBUSTION ENGINES

Joseph Driscoll, New York, N. Y.

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4 Claims. (Cl. 219—38)

The present invention relates to an attachment for a carburetor of the type generally used with internal combustion engines.

The primary object of the invention is the provision of an attachment to the carburetor of an internal combustion engine that will greatly facilitate the starting of the engine in extremely cold weather.

A further object of the invention is the provision of a device adapted to heat cold air drawn from the atmosphere and, after heating, conveying it thru the carburetor and into the engine, thus causing the gas to be more rapidly ignited.

A still further object of the invention is the provision of a device that may be mounted without difficulty to the carburetor of an engine and adapted to heat and convey heated air into the carburetor utilizing mechanical means for controlling the entrance of the heated air.

The invention will be fully and comprehensively understood from a consideration of the following detailed description when read in connection with the accompanying drawings which form part of the application.

In the drawings:

Fig. 1 is a front elevational view illustrating the device attached to a carburetor.

Fig. 2 is a top plan view of the device and showing in section the air filter tube.

Fig. 3 is an enlarged front elevational view similar to Fig. 1 with the carburetor and air filter cap omitted.

Fig. 4 is a transverse sectional view taken on line 4—4 of Fig. 2.

Fig. 5 is a vertical sectional view thru the electrical heating means.

Fig. 6 is a sectional view taken on line 6—6 of Fig. 5; and

Fig. 7 is a detailed wiring diagram of the electrical circuit used in the device.

It is well known that considerable difficulty is experienced with the starting of an internal combustion engine in cold weather. It is also well known that by preheating the air entering the carburetor a more rapid starting is in effect. The present invention is, therefore, designed to serve to preheat and feed to the carburetor heated air which is in turn carried into the engine causing the gas to ignite in a more rapid manner.

Referring to the drawings for a more detailed description thereof, the numeral 10 indicates generally a carburetor attached to an intake manifold 11 of an internal combustion engine, not shown. The carburetor 10 is of the down draft type and the invention is disclosed there-

with for purposes of illustration only, it being understood that the device, with slight modification, is applicable with any type carburetor.

The preheating attachment indicated generally by the numeral 12 is attached to the air filter pipe 13 of the carburetor 10 by removal of the filter cap 14. By referring to Fig. 3 of the drawings it will be noted that the attachment 12 includes a circular section 15 that is slidable on the filter pipe 13 and attached thereto by any desired means. After placement of the section 15 on the filter tube 13 the cap 14 is then replaced and the carburetor is adapted to function in its normal manner.

Extending from the circular section 15 and integral therewith, is a metallic heater casing 16 in the form of a conduit which conveys the air to the carburetor 10 that has been heated thru the heating mechanism 17. The heater casing or conduit 16 is elbow-shaped so as to space the heating mechanism 17 from the engine and permit the entrance of atmospheric air for heating purposes. A butterfly valve 18 is supported within the casing 16 and is actuated in unison with a second butterfly valve 19 provided in the filter tube 13. The means for actuating the valves 18 and 19 will be hereinafter described.

The heating mechanism 17 includes a casing 20 which is preferably constructed of metal and integral with the case 16 and of the shape illustrated in Fig. 5 of the drawings. A second casing 21 is frictionally held within the casing 20 and said second casing provides a dead air space 22 for insulating purposes. The casing 20 is preferably insulated so as to create a more rapid heating of the incoming atmospheric air, since said air will not directly contact the walls of said casing, which normally would be in a cold condition. The casing 21 has attached thereto by any desired means a perforated cover plate 23, and a second perforated cover plate 24 is held in engagement with said plate 23. By rotation of the plate 24 the perforations of the plates 23 and 24 may be brought into alignment for entrance of atmospheric air into the central chamber 25. The means for heating the air drawn into the chamber 25 includes a bulb 26 adjustably supported within the casing 20. The bulb 26 is adjustable by rotation of the threaded screw shaft 27 thru means of the knurled cap 28 at its outer end and which actuates the bracket arms 29 of the socket 30, which arms are threadedly received on the screw shaft 27. The inner end of the screw shaft 27 is journaled in a support 31 attached to the inner casing 21. Current

is supplied to the bulb 26 by means of the wire 32 which is connected to a battery or other source and is threaded thru the plates 23 and 24 thru the insulating member 33 supported in the central portion of said plates.

The means for controlling the admission of heated air into the carburetor and also the means for actuating the heating mechanism is preferably controlled from the dash board of the vehicle. Provision is made whereby the butterfly valves in the heating casing 16 and the air filter pipe 13 are simultaneously controlled and when actuating the same the bulb 26 of the heating mechanism is illuminated in addition to a pilot or signal light supported in the dash board. The numeral 34 indicates a control rod extending from the actuating mechanism to the dash of a vehicle, not shown. A knob portion 35 is attached to the outer end of a wire 36, which wire is slidable within the cable 34 and the opposite end 37 is connected to an arm 38 of a bell crank lever 39. The end 40 of the lever 39 is provided with a cam-shaped slot 41 adapted to receive a depending arm 42 carried by the horizontal strip lever 43 and adapting to actuate the same. The free end of said lever 43 is slidable in a guide bracket 43' attached to the casing 16. Also connected to the lever 43 is an L-shaped link 44 fixedly secured to a shaft 45, which shaft supports the butterfly valve 18 maintained within the heating casing 16. A second L-shaped link 47 is attached to the outer end of the lever 43 which is in turn secured to a shaft 48, which extends thru the section 15 and supports thereon the butterfly valve 19. The butterfly valve 19 is adapted to seat on bearing members 49, see Fig. 4, of which there are two disposed in different planes within the casing 16 so as to provide a sealing means to prevent the entrance of air when said valve is in closed position. From the description of the actuating means it will be noted that a pressure inwardly on the wire 36 supported within the cable 34, will serve to actuate the lever 39, whereupon the horizontal lever 43 will be moved in the direction of the arrow 50 to open the valve 19 and close the valve 18, said valves being actuated thru the links 44 and 47, respectively, which are attached to the horizontal lever 43. When in this position, air is admitted to the carburetor thru the filter cap 14 and the heating mechanism is in its inoperative position. By pulling on the wire 36, the lever 39 will be actuated and the horizontal lever 43 will then move in the direction of the arrow 51 to close the valve 19 and simultaneously open the valve 18 so that air heated within the casing 17 will be admitted into the carburetor and cylinders.

As previously described, operation of the actuating mechanism for the valves 18 and 19 will at the same time make and break an electrical circuit to the bulb 26 of the heating mechanism and pilot light carried by the dash. The shaft 48 also carries on the end opposite the valve 19 a swinging contact member 52, which member moves with the rotation of the shaft 48 caused by actuation of the arms 42 and 47, respectively. The contact arm 52 supports thereon a non-conducting element 53 at the lowermost portion thereof and in addition thereto carries a conducting element 54 attached to said non-conducting element 53. Contact members 55 and 56 are carried by and insulated from a bracket member 57 attached to the mechanism in any desired manner and current is supplied to said contact members 55 and 56 from the battery or

other source of power. The contact member 55 controls the illumination of the bulb 26 within the casing 17 and the contact member 56 is connected directly to the pilot or signal lamp 58. In Fig. 3 of the drawings the contacts are shown in full lines with the heating device in operation. In other words, contact is made thru the conductor 54 and contact member 55 so as to complete a circuit to the bulb 26. The contact member 56 comprises a pair of normally contacting metallic plates, as illustrated in Fig. 2 of the drawings, and when said plates are in contact a circuit is completed to the pilot light. However, when the contact arm 52 moves to the position illustrated in dot and dash lines in Fig. 3 of the drawings, the non-conducting or insulated portion 53 breaks the contact of the member 56 and likewise of the member 55 so that the flow of current to the pilot light and bulb 26, respectively, is broken. It is again pointed out that actuation of the horizontal arm 43 causes rotation of the shaft 48 and since said contact arm 52 is carried on the shaft 48 it moves in unison therewith.

The electrical circuit utilized is illustrated in Fig. 7 of the drawings wherein the numeral 59 indicates the pilot light. The circuit is connected thru an ammeter 59 to the battery 60 and grounded at 61. In said diagram it will be noted that the switch or contact element 56 is normally closed while the contact 55 is opened and closed by means of the pivotal arm 52 so as to make and break the circuit to the bulb 26 which bulb is also grounded, as indicated at 62.

In the operation of the device herein described, when desiring to start an internal combustion engine in cold weather and prior to the use of the electrical starting means, the wire 36 is pulled outwardly by grasping the knob portion 35, which action actuates the levers 39 and 43 to open the valve 18 and close the valve 19. It is understood that the valve 19 is closed so as to prevent the entrance of cold air thru the filter cap 14. The means for opening and closing the valves 18 and 19, respectively, also moves the pivotal contact arm 52 from the position illustrated in dot and dash lines in Fig. 3 of the drawings to the position illustrated in full lines, at which time the bulb 26 is illuminated and also the pilot light 58, which pilot light serves to signal that the device is in operation. The starting mechanism is actuated whereby atmospheric air will be drawn into the casing 17 thru the openings provided in the covers 23 and 24 and said air is heated as it is conveyed past the bulb 26 into the casing 16. In extremely cold weather it may be necessary to adjust the bulb 26 toward the outlet so as to reduce the space of the outlet thereby increasing the heating of the air as it is conveyed therethru. The adjusting means comprises the threaded shaft 27 and knurled portion 28, upon rotation of which moves the bracket 29 that supports the socket of the bulb 26. After an interval of time, sufficient heated air has been discharged into the carburetor 13 so as to heat the gas and upon again actuating the starting means, the ignition switch will be turned on.

The feature of the electrical system being connected thru the ammeter will serve to indicate on the ammeter when the bulb 26 is illuminated since, when said bulb is illuminated, the ammeter will show a greater discharge than when not illuminated. The utility of the pilot light 58 is to indicate to the operator when the device is in operation since it is preferable to discontinue operation of the device after the motor has

started. Discontinuance is brought into effect by pushing forward on the wire 36 which, thru the action of the levers 39 and 43, will close the valve 18 and open the valve 19, and at the same time break the circuit to the heating mechanism.

It is to be understood that this improvement is capable of extended application and is not confined to the exact showing of the drawings nor to the precise construction described and, therefore, such changes and modifications may be made therein as do not affect the spirit of the invention nor exceed the scope thereof as expressed in the appended claims.

What is claimed as new is:

1. The combination with a carburetor having an inlet pipe, of means for supplying heated air to said carburetor and including a conduit attached to said inlet pipe, valve means in said pipe and conduit, means for actuating said valve means for alternately opening and closing the same, heating means including a casing attached to said conduit, adjustable air inlet means for said casing, an electrical heating element movable in said casing toward and away from the inlet end of the conduit, manual means for moving said heating element and means associated with said valve actuating means for operating in unison therewith and for controlling a circuit to said heating element.

2. The combination with a carburetor having an air inlet pipe, of means for supplying heated air to said carburetor and including a conduit attached to said inlet pipe, valve means in said pipe and conduit, means for actuating said valve means for alternately opening and closing the same, heating means including a casing attached to the conduit, an electrical heating element including a lamp bulb, a socket therefor, screw means rotatably mounted in the casing and having the socket threadedly connected thereto for adjusting the bulb toward and away from the inlet end of the conduit, means for admitting atmospheric air into said casing, means for adjusting the admitting means, and means associated with said valve actuating means for operating in unison therewith and for controlling a circuit to said heating element.

3. The combination with a carburetor having

an air inlet pipe, of means for supplying heated air to said carburetor and including a conduit communicating with the air inlet pipe, valve means in said pipe and conduit, means for actuating said valve means for alternately opening and closing the same, heating means including a casing mounted on said conduit, adjustable air inlet means for said casing, a second casing within and spaced from the first casing and comprising a dead air space therebetween, an electrical heating element within the casings, means for adjusting the electrical heating element toward and away from the inlet end of the conduit and including a screw shaft rotatably mounted in the casing and extending therefrom, means on the shaft to be supported thereby and for movement thereon, means on the outer end of the shaft for rotating the same, bracket means extending from the first casing, and means mounted on the bracket means and having the valve actuating means connected thereto for operation therewith in unison and for controlling a circuit to said electrical heating element.

4. The combination with a carburetor having an air inlet pipe, of means for supplying heated air to said carburetor and including a conduit attached to said inlet pipe, a valve in the inlet pipe, a valve in the conduit, a shaft for each valve, links on the shafts, a guide bracket on the conduit, a lever slidably mounted in the guide bracket and having the links pivotally secured thereto, heating means including a casing attached to the conduit, adjustable air inlet means for said casing, a bracket on the casing, a bell crank lever pivotally secured to the latter bracket and having a cam slot in one of the arms thereof, means on the first lever and mounted in the slot for reciprocating the first lever upon movement of the bell crank lever for alternately opening and closing the valves, means for actuating the bell crank lever, an electrical heating element within the casing and adjustable toward and away from the inlet end of the conduit, and means mounted on the last mentioned bracket and one of the shafts for operating in unison with the valves for controlling a circuit to the electrical heating element.

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