Jan. 23, 1934. E. DICKEY 1,944,225

CARBURETOR

Filed July 31, 1929 4 Sheets-Sheet 1

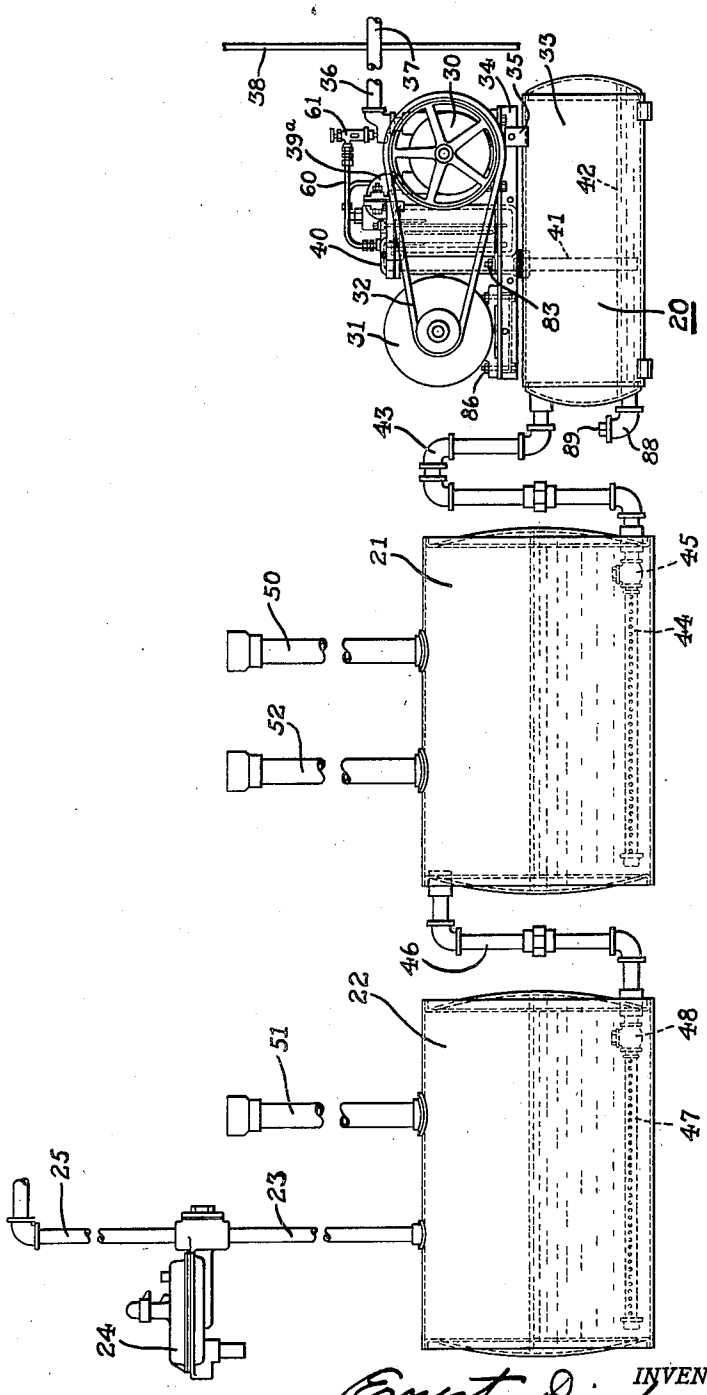


Fig. 1

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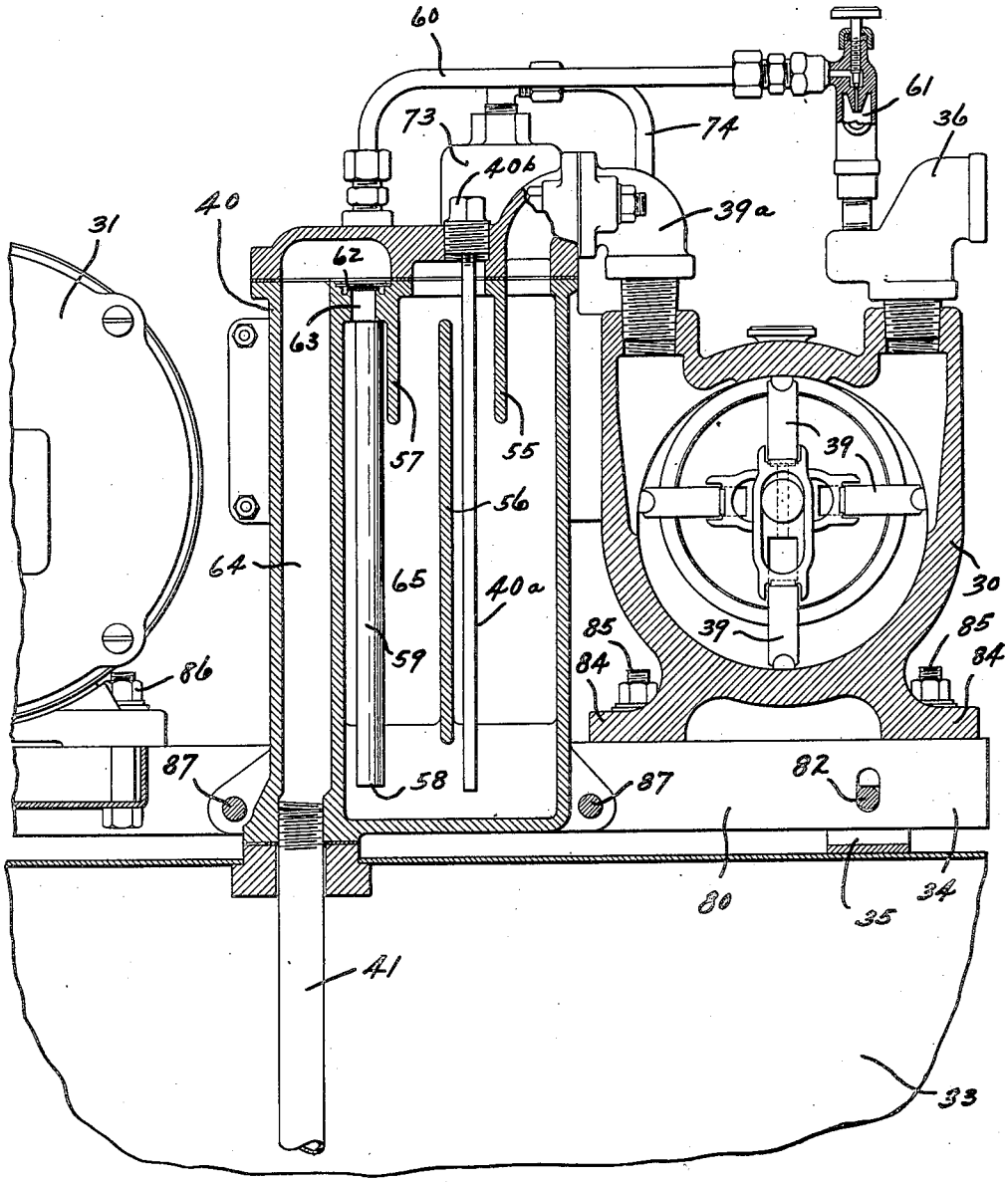


Fig. 2

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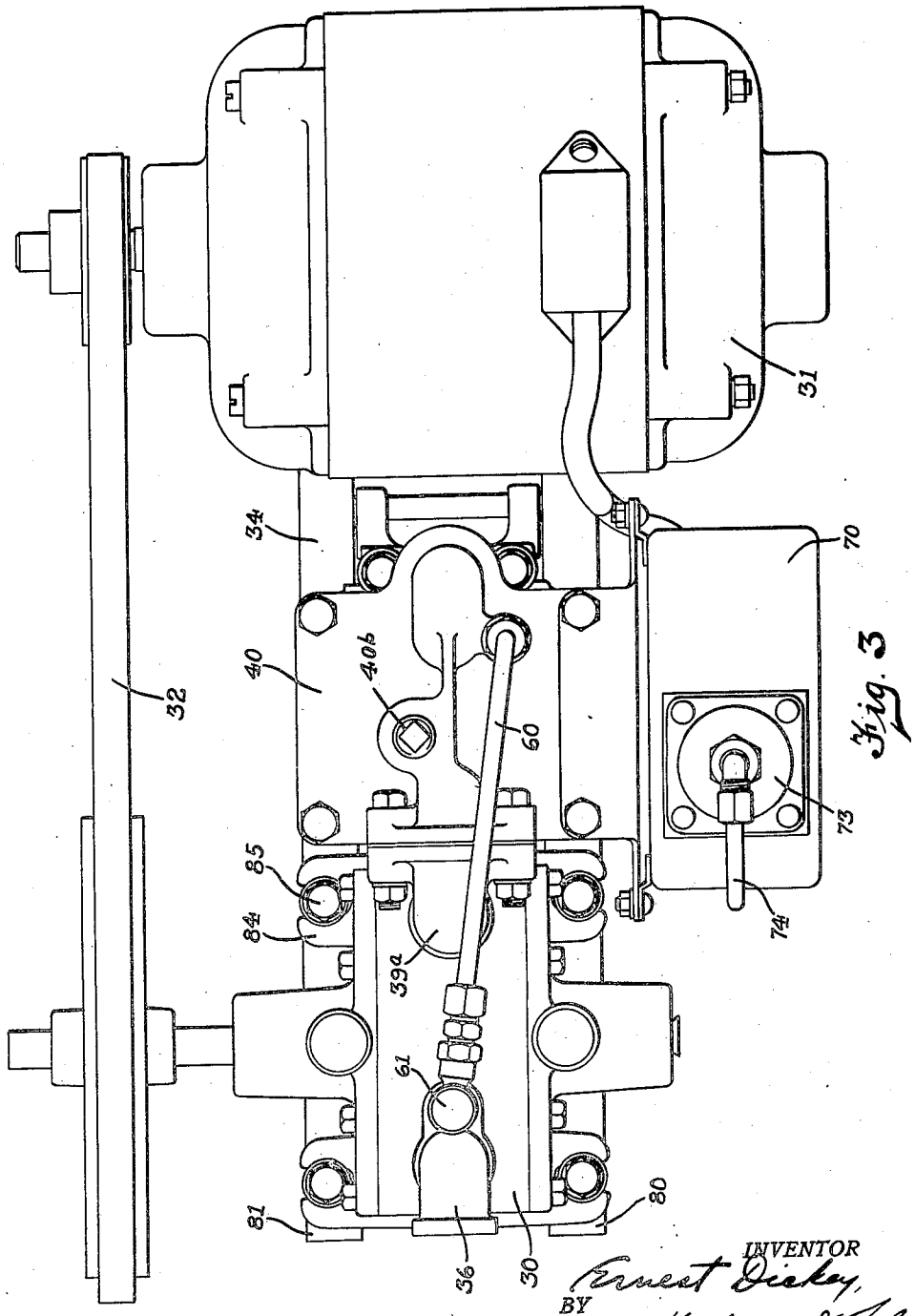


Fig. 3

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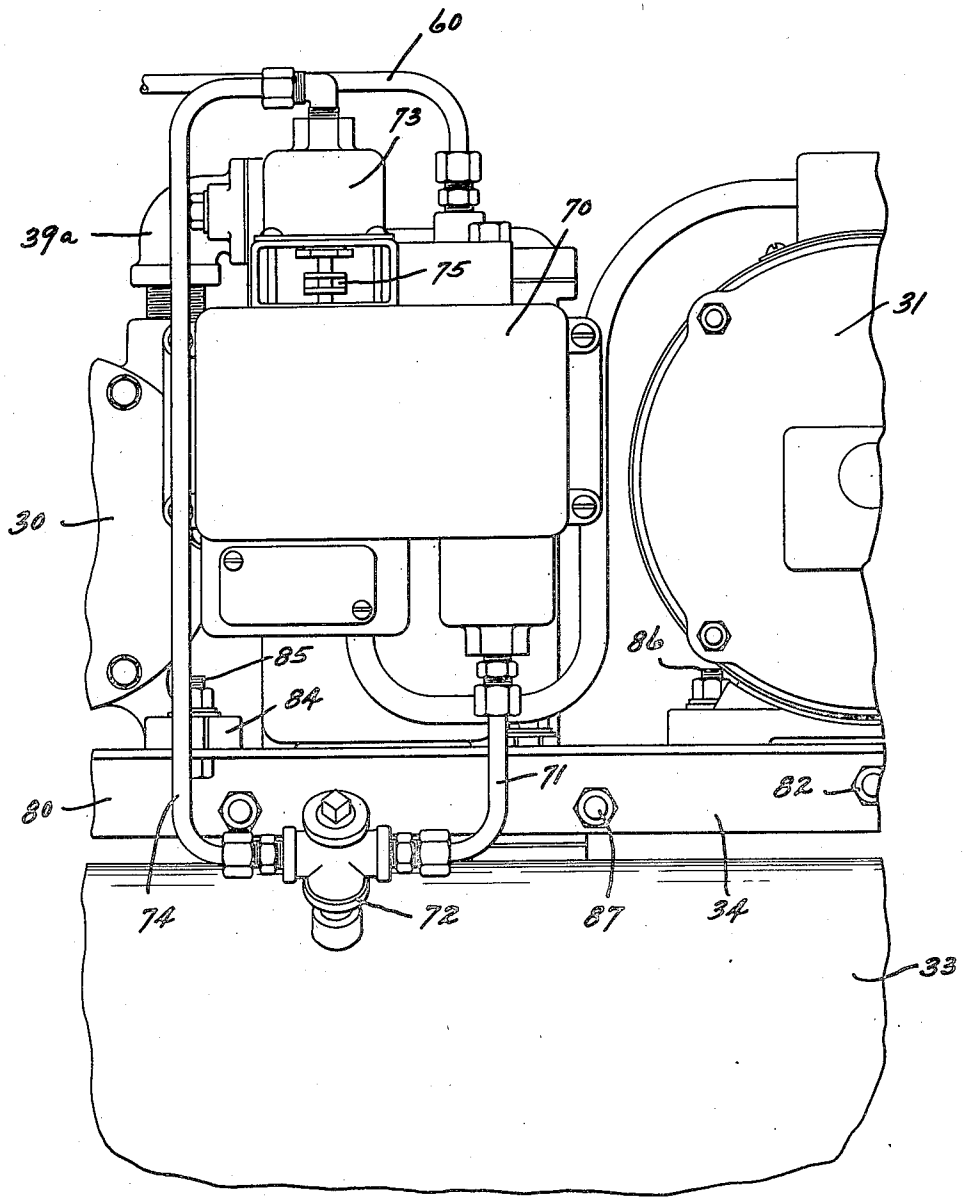


Fig. 4

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Patented Jan. 23, 1934 1,944,225

UNITED STATES PATENT OFFICE

1,944,225

CARBURETOR

Ernest Dickey, Dayton, Ohio, assignor to Delco-Light Company, Dayton, Ohio, a corporation of Delaware

Application July 31, 1929. Serial No. 382,446

1 Claim. (Cl. 261—30)

This invention relates to an electrical apparatus and more particularly to a carburetor which may be electrically driven.

An object of this invention is to provide an electrical apparatus adapted to furnish carbureted air automatically for household purposes.

Another object of this invention is to provide a carburetor adapted to furnish carbureted air of substantially constant richness.

Another object of this invention is to provide an apparatus for carbureting air which provides carbureted air of substantially constant richness.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred form of the present embodiment is clearly shown.

In the drawings:

Fig. 1 is a side elevation of an apparatus embodying features of this invention;

Fig. 2 is an enlarged vertical cross sectional view of a portion of the apparatus shown in Fig. 1;

Fig. 3 is a top plan view of a portion of the apparatus shown in Fig. 1, and

Fig. 4 is a side elevation taken from the rear of the portion of the apparatus shown in Fig. 2.

Carburetion, according to this invention, may be accomplished by contacting air, preferably in the form of a stream and if the demand requires, periodically with a body or charge of gasoline having a series of unequally volatile constituents, substantially all such constituents being sufficiently volatile to charge such air for non-explosive combustion use, suitable for burner use, for instance in household stoves, water heaters and the like. This type of gasoline may be what is ordinarily called casing head gasoline, for instance, having a specific gravity of 88° B., and at present known in the trade as Grade BB. This type of gasoline is condensed or absorbed from gases coming from the casing head of gas wells, so that all of the constituents are relatively volatile under the conditions hereinafter to be described. The air after having been contacted with the above named gasoline may then be contacted with a body of equalizing liquid, such as ordinary gasoline now sold for automotive purposes and which may have for instance a specific gravity of 68° B.

This carburation is particularly advantageous when the air is contacted with an entire charge of the casing head gasoline. When a stream of air is continuously passed through such gasoline, the stream of air takes up the more readily volatile constituents, so that after a portion of the charge of gasoline has been carbureted the remainder of the gasoline produces a less rich mixture of air and gasoline. For this reason, under ordinary conditions, the carbureted air which is discharged from household carburetors varies in richness throughout the use of one charge of gasoline. According to this invention, however, the air after having passed through the charge of casing head gasoline is contacted with a body of equalizing liquid, such as ordinary gasoline as is now supplied for automotive use. The carbureted stream of air in passing through this last named gasoline gives up some of its gasoline constituents during the period when the casing head gasoline charge is still fresh. However, when the stream of carbureted air begins to diminish in richness, these constituents are restored to the stream of carbureted air and thus the stream is maintained at a substantially constant degree of richness throughout the carburation of one charge or "batch" of casing head gasoline.

An apparatus is disclosed in the drawings which may be used to accomplish this purpose. The apparatus may comprise, in general, means 20 for automatically maintaining air compressed within predetermined pressure limits. The means 20 may have a connection with a device 21 for contacting the air, preferably in the form of a stream, with the body, charge or "batch" of gasoline having a series of unequal volatile constituents, substantially all such constituents being sufficiently volatile to charge such air for non-explosive combustion use. Thus the means 21 may comprise a tank containing casing head gasoline of substantially 88° B. specific gravity and at present known in the trade as Grade BB. The stream of air carbureted by the means 21 may then be contacted with a body of equalizing liquid in the device 22. Thus the device 22 may comprise a tank containing gasoline as now ordinarily supplied for automotive use, and for instance having a heavier specific gravity, for instance, 68° B. The carbureted air may then be discharged from the device 22 through a discharge pipe 23 which may, if necessary, have a pressure reducing device 24 adapted to deliver the carbureted air through the pipe 25. The air in pipe 25 has a substantially lower pressure automatically maintained at predetermined pressure limits lower than those pressure limits maintained by the means 20. Thus the means 20 may maintain air between the pressure limits of two and seven pounds respectively whereas the means

24 may maintain the carbureted air in pipe 25 at substantially four ounces pressure.

The means 20 may be any suitable means for automatically supplying air compressed within predetermined pressure limits. Thus a compressor 30 may be provided and may be drivingly connected with an electric motor 31 by means of a belt 32. The compressor 30 may, if desired, discharge compressed air into a tank 33. If desired, the motor 31, compressor 30 and other cooperating devices may be mounted on top of the tank 33, for instance by providing a suitabe angle iron frame 34 connected to lugs 35 which may be welded to the tank 33.

The compressor 30 may be provided with an air intake 36, which, if desired, may have its air inlet 37 outside of the building 38 in which the means 20 is located. The compressor 30 may be of the rotary type and may be provided with rotary vanes 39, this type of compressor being well known. The compressor may be provided with an air discharge 39*a* forming part of the compressed air connection of the compressor with the means 21. The compressed air connection may also include an oil separator 40, adapted to remove entrained lubricating oil particles from the air discharged from the compressor 30. The air, after passing through the separator 40, may be discharged into the tank 33, preferably by extending a pipe 41 below the level of a body of lubricating oil 42 adapted to be placed in the bottom of the tank 33. The compressed air from the tank 33 is adapted to be discharged through a pipe connection 43 into the bottom of the tank 21, preferably through a perforated pipe 44 placed along the bottom of the tank 21. A check valve 45 may be placed between the pipe 44 and the pipe 43, which is adapted to prevent the backward flow of gasoline from the tank 21 to the tank 33. The air is adapted to pass in the form of a stream through the gasoline in the tank 21, where it becomes carbureted and is adapted to pass out through a pipe 46 to the bottom of the tank 22, preferably through a perforated pipe 47 where the richness of the stream is equalized. A check valve 48 may be provided between the pipe 47 and the pipe 46, which is adapted to prevent the flow of gasoline from the tank 22 to the tank 21. The carbureted air, after passing through the gasoline, preferably in the form of a stream in the tank 22 is discharged through the pipe 23 and has its pressure reduced by the device 24 discharging into the pipe 25, which may be connected to suitable appliances, such as ordinary cook stoves, water heaters or the like. Preferably the tanks 21 and 22 are placed outside of the buildings, and may be buried under ground. The tanks are therefore provided with filler pipes 50 and 51 respectively, while tank 21 may be further provided with a level indicator 52 for indicating the level of the charge of gasoline in the tank 21. The means 20 may, if desired, be placed in the basement or the like of the residence or building which is to be supplied with the carbureted air.

The oil separator 40 may be provided with means for returning separated oil to the compressor 30 only during the operation of said compressor. This may be accomplished by providing a series of baffles 55, 56 and 57 adapted to remove the entrained lubricating oil from the compressed air. These baffles are adapted to build up a body of oil in the separator 40 above the level of the inlet 58 of the pipe 59. The pipe 59 may be connected to another pipe 60 connected to a sight feed type of lubricator 61 which discharges into the intake 36 of the compressor 30. Check valve 62 may be placed in the separator 40, preferably at the top of the passage 63 leading to the downwardly directed passage 64 which is connected to the pipe 41. The check valve 62 allows the compressed air to pass on to the passage 64 and the pipe 41, but prevents any back flow of the air. Thus during the operation of the compressor 30 the space 65 of the separator 40 is under the same pressure which prevails in the tank 33, but during the periods of idleness of the compressor 30 the pressure in the space 65 drops to atmospheric pressure because of the slow leakages in the compressor 30. Thus when superatmospheric pressure prevails in the space 65, oil is forced up through the pipe 59 and the pipe 60 to the sight feed 61; but during the period of idleness of the compressor no oil is thus fed because of the lack of superatmospheric pressure in the space 65. It is seen that there is provided a periodically operated compressor having a compressed air connection with the carbureting device, and that said connection is provided with a lubricant separator with means for returning separated oil to the compressor only during the operation of said compressor.

An oil indicator may be provided for the separator 40. Thus a gauge rod 40*a* may be attached to a threaded plug 40*b* having a threaded connection with the casing of the separator 40. Thus the rod 40*a* may be removed and inspected, since its oil covered portion indicates the level of oil in the separator.

The electric motor 31 may be provided with an automatic switch 70 for starting and stopping the motor to maintain a body of air under predetermined pressure limits. The switch 70 may be of any of the well-known pressure responsive switches. Its pressure responsive device may be connected by means of a pipe 71 with a T connection 72 leading into the air space of the tank 33. The switch 70 is adapted to start the motor when the pressure in the tank 33 falls to 2 lbs. pressure. The switch is adapted to stop the motor 21 when the pressure of the air in the tank 33 reaches an upward limit of 7 lbs. pressure.

If desired, the switch 70 may be provided with a safety device 73 adapted to lock the switch in an open position if the pressure in the tank 33 should ever fall substantially below 2 lbs., or the lower limit of the normal operation. The safety device 73 may have a pressure responsive element connected by means of the pipe 74 with the T connection 72. The pressure responsive element of the safety device 73 is adapted to actuate a locking device which holds the switch 70 in an open position by means of a hook like member, not shown, until a manual reset 75 is operated. Thus, if for any reason the source of electricity which is connected with the motor 31 should fail, so that the pressure in the tank 30 falls below 2 lbs., then the locking device would prevent the motor from starting again until after the reset 75 has been manually actuated. This would prevent the carburetor from supplying air to the appliances after a failure of the source of electricity. This is advantageous for the reason that it would be dangerous to supply carbureted air after such appliances might have become extinguished by reason of the failure of carbureted air supply.

The frame 34 may include two parallel angle irons 80 and 81 which may be secured by means of bolts 82 to two or more lugs 35. The connection at the lower end of the separator 40 may be provided with clamping means 83 for securing the angle iron frame to the tank at another point. The compressor 30 may be provided with legs 84 adapted to be clamped by bolts 85 to the angle iron frame members 80 and 81. The motor 30 may be slidingly mounted on the angle iron frame members 80 and 81 by means of the bolts 86. The separator 40 may be connected to the angle iron members 80 and 81 by means of the bolts 87. The tank 33 may be provided with a lubricating oil filter 88 having a closing plug 89.

Thus it is to be seen that air may be contacted preferably in the form of bubbling stream with a charge or "batch" casing head gasoline in the tank 21. The air is preferably fed under pressure within predetermined pressure limits. When the charge or "batch" of gasoline in the tank 21 is fresh, as at the beginning of its use, the most volatile constituents are taken up by the air to form a gas of high richness. When the carbureted air passes through the body of equalizing liquid in the tank 22 it gives up some of these constituents, by reason of the absorption powers of the liquid. This continues during the first part of the use of the charge or "batch" of gasoline in the tank 21. However, during the later period of use of the charge in the tank 21, the air is carbureted to a less richness so that the body of gasoline in the tank 22 begins to give up the constituents which it formerly took up from the air and thus the carbureted air is maintained in a condition of constant richness during the last stages of the use of the charge in the tank 21. When desired, the charge or "batch" in the tank 21 may be replenished when part or all of the charge is exhausted by adding another charge of casing head gasoline through the filler pipe 50. The gasoline in the tank 22 tends to remain at substantially the same level and should be sufficient to last a relatively long time without addition or change.

The check valve 62 is adapted to be sealed by liquid if it should tend to leak. Since the pipe 41 extends below the level of the oil in tank 33, any back leakage of air past the valve 62 causes oil to rise in pipe 41 and passage 64 to supply a liquid oil seal for valve 62. This effectually stops air leakage.

Other features, not inconsistent with this application, are described in my application for Electrical apparatus Serial No. 382,445 executed on even date herewith.

Where electric current is not available, the device 20 may be replaced by some other type of compressor, such as the well-known weight operated, water sealed, air blower often used with household carburetors.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understood that other forms might be adopted, all coming within the scope of the claim which follows.

What is claimed is as follows:

A carburetor comprising air compressing means for automatically maintaining air compressed within predetermined pressure limits, a gasoline charge holding device with means for contacting air with said charge connected to said air compressing means, a second charge holding device for holding a different charge of gasoline with means for contacting air with said last named charge, said second charge holding device having air connections with said first named charge holding device, a carbureted air discharge pipe from said second charge holding device, said air compressing means including a compressor with moving parts and adapted to be intermittently operated and means for applying oil to said parts only when said compressor is operating.

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