

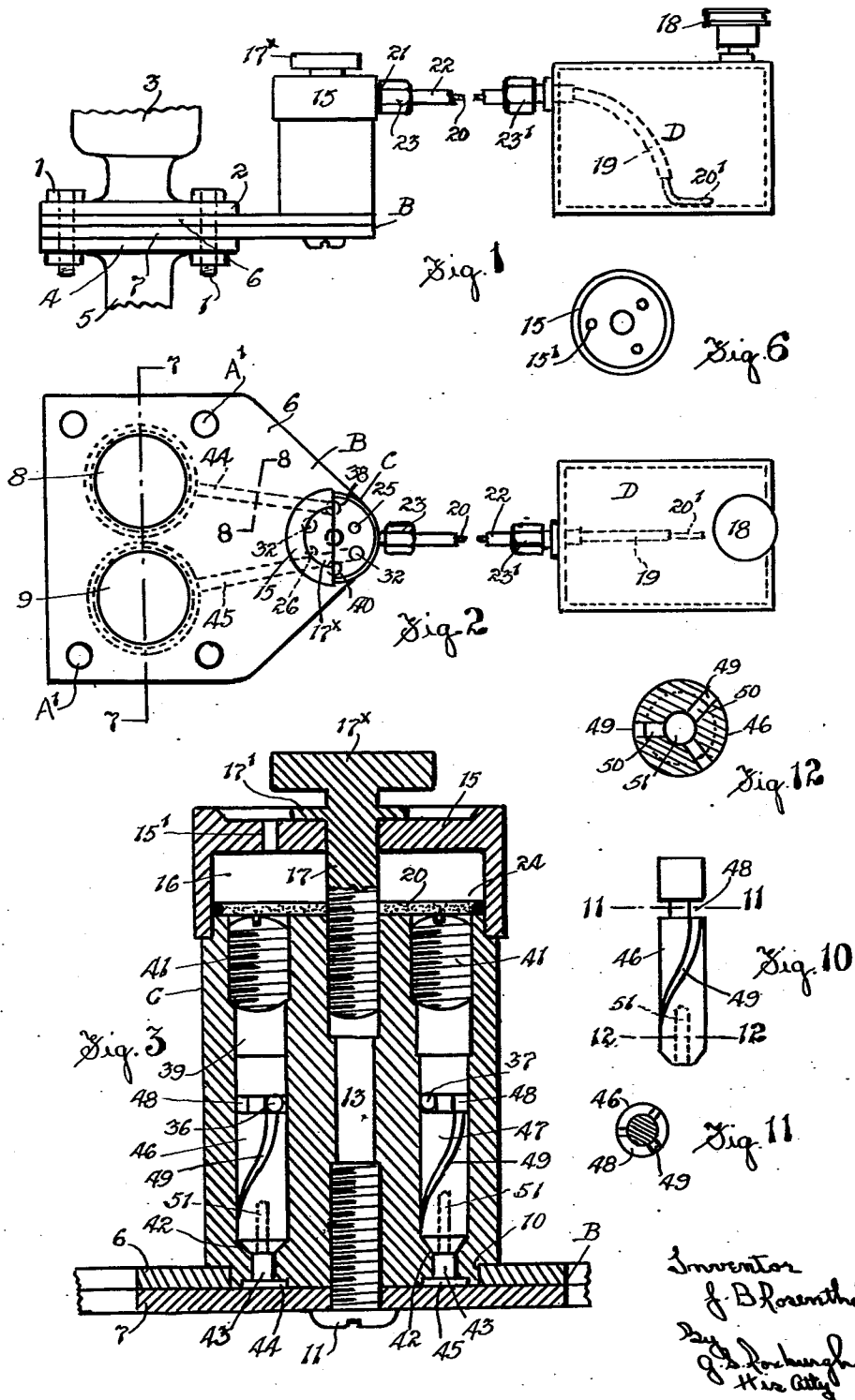
Oct. 22, 1957

J. B. ROSENTHAL
FIRING MIXTURE BOOSTER

2,810,561

Filed Oct. 31, 1955

2 Sheets-Sheet 1



Oct. 22, 1957

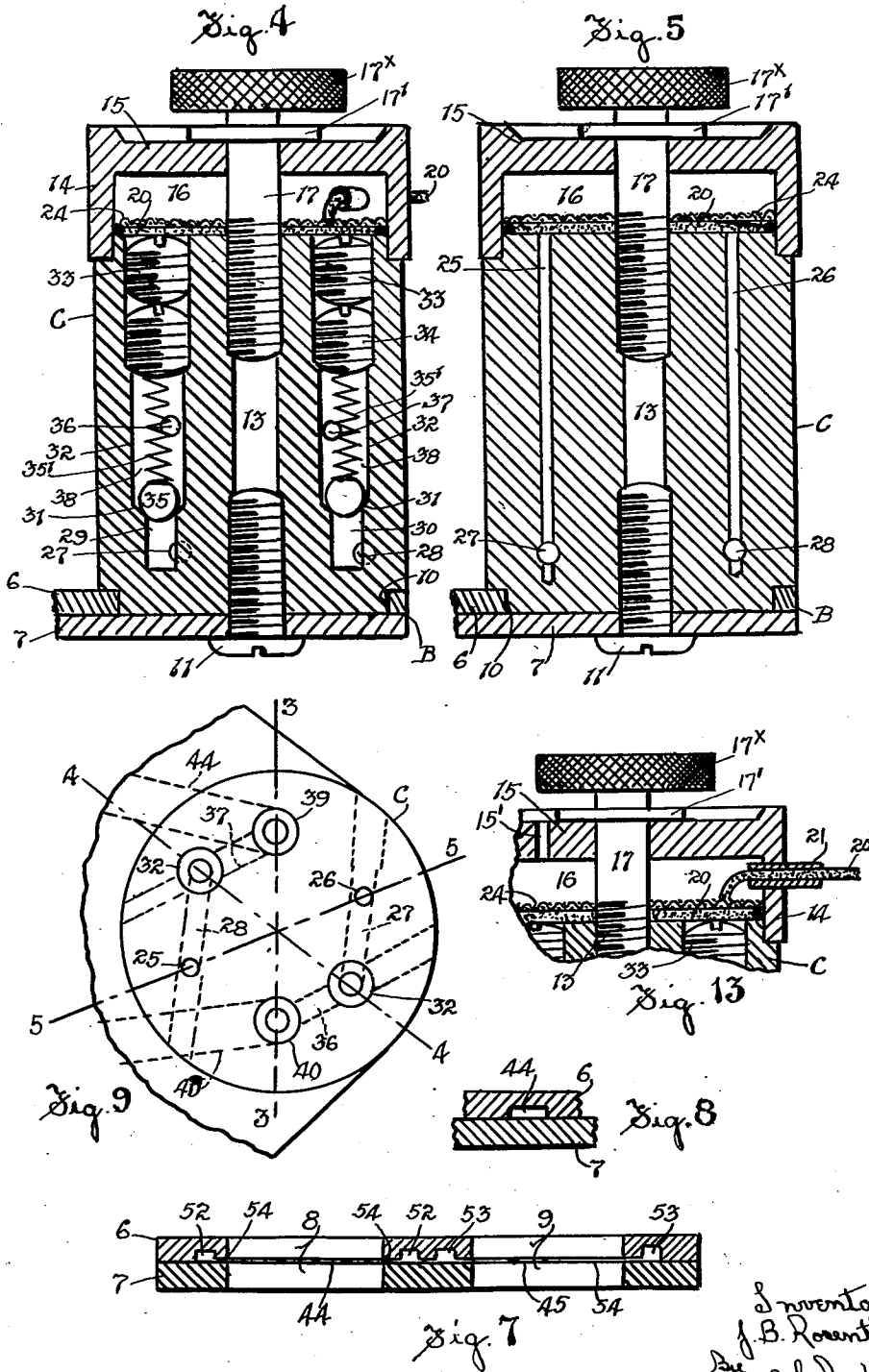
J. B. ROSENTHAL

2,810,561

FIRING MIXTURE BOOSTER

Filed Oct. 31, 1955

2 Sheets-Sheet 2



Inventor
J. B. Rosenthal
By J. S. Foxburgh
His Atty.

1

2,810,561

FIRING MIXTURE BOOSTER

Jacob B. Rosenthal, Winnipeg, Manitoba, Canada

Application October 31, 1955, Serial No. 543,981

5 Claims. (Cl. 261—65)

The invention relates to a device for supplying a highly mixed and vapourized quantity of a special liquid mixture from a container to the intake manifold of an internal combustion engine so that the final mixture passing to the engine will effect the better operation of the engine with increased mileage per gallon of fuel, better lubrication of the internal parts of the engine, minimize knocking and obviate to a great extent carbonization and burning of cylinders and valves.

A further object is to provide a self contained unit for the above purpose which can be easily and quickly mounted in operating position by placing a part of it between the detached connecting flanges of the engine carburetor and intake manifold and then reconnecting the flanges by the usual bolts supplied for the purpose, the tightened bolts passing through said part and serving to effectively clamp my device in a selected operating position.

A further object is to provide a unit which can be easily and cheaply manufactured and assembled and which serves to very thoroughly mix and vapourize the passing, special fuel used and to direct such highly vapourized mixture into the firing mixture passing from the carburetor to the manifold.

A further object is to provide the device with internal valves held normally seated by adjustable springs and designed to open automatically at a selected time and under the influence of the suction of the engine.

A further object is to provide the unit with rotary mixers rotated by the passing fuel to break up and vapourize such fuel.

A further and more detailed object is to provide a unit embodying a tank to contain the special liquid mixture, an encased wick to feed the mixture from the tank to a vapourizing and mixing block supplied and to provide plates for insertion and mounting between the existing carburetor and intake manifold flanges, said plates rigidly supporting the block and being provided with passages leading from the base of the block to the existing passage for the usual firing mixture passing from the carburetor to the manifold.

A further object is to supply the plates with registering holes for registration with the existing outlets from the carburetor and intakes to the manifold and to supply circular slots surrounding said holes and communicating with the aforesaid passages in the plates and to provide the slots with comparatively narrow outlets opening to the areas through which the firing charge passes from carburetor to manifold.

With the above more important and other minor objects in view, which will become more apparent as the description proceeds, the invention consists essentially in the arrangement and construction of parts hereinafter described, reference being had to the accompanying drawings, in which:

Fig. 1 is a side view of the booster, the tube or pipe between the block and tank having been broken away and the plates having been inserted in supporting and

2

operating position between the existing, connecting flanges of the engine carburetor and intake manifold.

Fig. 2 is a plan view of the booter, the carburetor having been removed and the cover of the block being shown cut in two vertically, and with one half removed.

Fig. 3 is an enlarged, vertical sectional view through the block and plates, the section being taken at 3—3, Fig. 9.

Fig. 4 is an enlarged, vertical sectional view through the block and plates, the section being taken at 4—4, Fig. 9.

Fig. 5 is an enlarged, vertical sectional view through the block and plates, the section being taken at 5—5, Fig. 9.

Fig. 6 is a plan view of the cover and showing the air admission holes therein, the cover fastening bolt having been removed.

Fig. 7 is an enlarged, vertical sectional view at 7—7, Fig. 2.

Fig. 8 is an enlarged vertical sectional view at 8—8, Fig. 2.

Fig. 9 is an enlarged, detailed plan view of the block, with the cover and various internal parts removed.

Fig. 10 is a side view of one of the rotary breakers within the block.

Fig. 11 is a horizontal sectional view at 11—11, Fig. 10.

Fig. 12 is an enlarged, horizontal sectional at 12—12, Fig. 10.

Fig. 13 is an enlarged, vertical sectional view through a portion of the cover and adjacent parts, the section passing centrally and longitudinally through the entry nipple for the wick tube.

In the drawings like characters of reference indicate corresponding parts in the several figures.

The device is a unit which can be easily and quickly mounted in operating position by simply undoing the customary bolts 1 which connect the existing base flange 2 of a carburetor 3 to the existing head flange 4 of the intake manifold 5 of an internal combustion engine and then inserting the mating, upper and lower plates 6 and 7 of the unit, between the detached flanges and subsequently inserting the bolts and tightening them up.

As carburetors and intake manifolds are well known, no further description of them is considered necessary.

The plates 6 and 7 are both of the same shape, as shown in Figs. 1 and 2 and both have a body portion A to become entered between the flanges 2 and 4 and a laterally extending portion B for supporting the block later described. The body parts A of the plates are supplied with registering holes A' to receive the bolts 1 subsequent to the insertion of the plates and obviously upon the inserted bolts being tightened up the plates become securely fastened together and their extensions become very rigidly supported. Both plates are supplied with similar openings 8 and 9 which register with the existing openings through which the usual firing mixture passes from the carburetor to the manifold.

I might mention here, that with eight cylinder engines, there are usually two passages for the firing mixture in passing from the carburetor to the intake manifold, and such is the reason that the two holes 8 and 9 are herein shown. Engines with less cylinders might require only one set of registering holes in the plates to register with the existing holes in the connecting flanges 2 and 4.

The block, generally indicated by the reference letter C, is herein shown as cylindrical and it is in the form of a solid piece of metal drilled and plugged to give the required passages, holes and ducts required. The lower end of the block is shouldered to seat in a hole 10 cut in the upper plate 6 and the block is securely held in place by a fastening bolt 11 passing through both plates and into a central, vertical, drilled passage 13 extending

through the block. The upper end of the block is also shouldered to receive the circular flange 14 of the cover 15 and the arrangement is such that there is an internal chamber 16 reserved between the top of the cover and the top end of the block. A central fastening bolt 17 is provided to tightly seat the cover, the bolt being screw threaded into the upper end of the passage 13 and being supplied with a finger piece 17* and with a circumscribing flange 17' engageable with the top of the cover.

Associated with the block is a relatively small tank 10 D for a fluid mixture and the fluid is highly mixed and vapourized in passage from the tank to the openings 8 and 9 and by way of the block. I have found that a fluid mixture of lubricating oil and castor oil very effectively serves my purpose, the vapourized lubricating oil lubricating internal parts of the engine and the vapourized castor oil very effectively preventing carbonizing and burning of internal engine parts such as cylinder walls, and valves.

The tank is substantially rectangular and is supplied with a filling plug 18 and contains a curved pipe 19 secured to an end wall of the tank and which pipe curves downwardly and contains a wick 20, the lower end of which is exposed within the tank as indicated at 20'.

The flange of the cover is fitted with a relatively short nipple 21 (see Fig. 13) and the nipple opens to the chamber 16. A stiff pipe or tube 22, of desirable length, connects the tank to the block, suitable couplings 23 and 23' being supplied to screw to the nipple and to the pipe 19. Actually the pipe 22 can be selected in length and shape to best accommodate the unit to the particular engine without interference with existing engine parts.

The wick, already mentioned, is threaded through the pipe 22 and the nipple 21 and enters the chamber 16 and has its entered end coiled over the top of the block as shown. A fine wire screen 24 is placed over the coiled end of the wick and atmospheric air is admitted to the chamber through a plurality of similar holes 15' drilled through the cover. Obviously the wick will liberate oil to mix with the air admitted to the chamber.

Two similar, vertical, side passages 25 and 26 (see Fig. 5) are drilled in the block and such have their upper ends communicating with the chamber and their lower ends communicating with similar, internal, horizontal ports 27 and 28 also bored in the lower part of the block and which ports communicate with similar, short, vertical ducts 29 and 30 drilled in the block (see Fig. 4) and provided at their upper ends with similar valve seats 31 formed in the lower ends of similar vertical passages drilled in the block and indicated by the reference numerals 32. These passages, each, have their upper end closed by screw plugs 33 and 34 which can be adjusted and locked in adjusted position to adjust the pressure of underlying, coiled springs 35' which have their lower ends resting on ball valves 35, in turn seated on the valve seats 31. The ball valves are of such diameter that a clearance space is reserved between the ball and the containing wall of the passage 32.

Similar, angularly disposed, horizontal holes are drilled in the block, to provide further, similar ports 36 and 37 leading from the valve chambers 38 to another pair of vertical passages 39 and 40 (see Fig. 3) which are drilled in the block and have their upper ends closed by screw plugs 41 and their lower ends tapered at 42 to communicate with lower outlet ports 43 opening to similar, diverging, slotted passages 44 and 45 supplied in the underside of the plate 6. Actually the latter passages are closed by the underlying plate 7.

The passages 39 and 40 provide cylinders which rotatably receive rotary mixers 46 and 47 which are circular in cross section. The two mixers are identical in construction. Each mixer has its upper end circumferentially slotted to provide a continuous, horizontal passage 48 and its lower end tapered to seat on the tapered lower end 42 of the associated passage 39 or 40 as

the case may be and the arrangement is such that the passage 48 communicates continuously with the entry ports 36 and 37 when the mixers are seated and which is the position they always maintain. The face of each mixer is provided with a plurality of similar, downwardly spiralling, spaced ducts 49 which have their upper ends opening to the passage 48 and their lower ends communicating with similar, ingoing ports 50 (see Fig. 12) drilled in the lower end of the mixer and communicating with a central, vertical passage 51 drilled in the mixer and which passage connects, in the seated position of the mixer, with the lower outlet port 43. In other words, any vapour entering the passages 48 passes downwardly through the ducts 49 and is then directed to the diverging passages 44 and 45 in the underside of the plate 6, and which lead to the openings 8 and 9.

In the underside of the upper plate 6, I cut similar, circular slots 52 and 53 which surround the openings 8 and 9 (see Fig. 7) and each slot has a continuous, restricted, or narrow side outlet 54 which communicates with the opening 8 or 9 as the case may be, it being understood that the underlying plate 7 closes the open side of the slots and outlets 54.

The above completes the description of the unit and the manner it is secured in operating position on the engine.

When in operation, the suction of the engine causes a flow from the tank to the openings 8 and 9. The vapour arising from the wick initially mixes with atmospheric air admitted to the chamber 16 through the openings 15' in the cover 15. This mixture passes down through the passages 25 and 26 to the ducts 27 and 28. At these points, the suction of the engine has unseated the ball valves 35 so that the vapour passes upwardly to the ports 36 and 37 and to the circular passages 48. From there the mixture goes down through the spiralling ducts 49 to the central passages 51 and is liberated to the diverging passages 44 and 45 which direct it to the slots 52 and 53 where it discharges into the passing firing mixture through the narrow outlets 54.

In passage from the tank to the points of admission to the firing mixture, the special mixture supplied by the tank is very effectively mixed and highly vapourized. The valves can be set so that they will remain closed for a desired period of time during the starting of the engine and on such account there is no change made in the firing mixture passing to the engine. This results in easy starting, in the usual way. Subsequently as the suction of the engine increases, the valves open and allow my highly vapourized mixture to enter the passing firing mixture and to become intimately intermixed therewith. Obviously the valves will close when the engine stops operating.

It will be obvious that the mixers will rotate under the pressure of the vapour passing downwardly through the spiralling ducts 49 and so operate to break up and vapourize the passing mixture.

What I claim as my invention is:

1. In a device for the purpose specified, a fluid mixing and vapourizing block having a central vertical passage therethrough and with the ends thereof screw threaded, a pair of surrounding, vertical, down-going passages the lower ends of which terminate in valve seats and the upper ends of which are closed to provide valve chambers, ports connecting the lower ends of the former passages with the latter passages at the valve seats, spring pressed valves within the valve chambers and normally pressed against the seats, a further pair of vertical passages surrounding the central passage and having their upper ends closed and their lower ends tapered and communicating with outlet ports from the block and provided midway of their length with ports communicating with the valve chambers and similar mixers rotatably mounted in the latter passages and positioned between the tapered ends thereof and the overlying entry ports,

5

said mixers being each provided with a plurality of spiralling ducts in continuous communication with the latter ports and the outlet ports from the block.

2. The device as claimed in claim 1 wherein the upper end of the block is closed by an applied seated cover having openings to atmosphere and said cover provides a mixing chamber above the upper end of the block and wherein the said cover is held seated by a jam screw screw-threaded into the upper end of the central passage.

3. The device as claimed in claim 1 wherein a pair of mating upper and lower plates support the block and the block is secured to the plates by a bolt passing upwardly through the plates and screw threaded into the lower end of the central passage of the block, the plates extend laterally from the attached block and have their lateral extensions provided with registering holes and passages are provided between the plates leading from the outlets from the block to the said holes in the lateral extensions of the plates.

4. In a device for the purpose specified, a fluid mixing and vaporizing block having a central vertical passage therethrough, a pair of surrounding, vertical, down going passages the lower ends of which terminate in valve seats and the upper ends of which are closed to provide valve chambers, ports connecting the lower ends of the former passages with the latter passages at the valve seats, spring pressed valves within the valve chambers and normally pressed against the seats, a further pair of vertical passages surrounding the central passage and having their upper ends closed and their lower ends tapered and communicating with outlet ports from the block and provided

6

midway of their length with ports communicating with the valve chambers, similar mixers rotatably mounted in the latter passages and positioned between the tapered ends thereof and the overlying entry ports, said mixers each being provided with a plurality of spiralling ducts in continuous communication with the latter ports and the outlet ports from the block and a pair of vertical side passages opening through the top end of the block and having their lower ends communicating through ports provided in the block with the above said latter ports which communicate through the valve seats with the first mentioned pair of passages.

5. The device as claimed in claim 4 wherein a cover is applied on and secured to the upper end of the block and provides a mixing chamber communicating with the first pair of passages set forth in said claim 4, and said cover is supplied with openings therein to atmosphere, a fine meshed screen lies on the upper face of the block and a wick, communicating with a source of fluid supply, enters the chamber and terminates in a coil resting on the screen.

References Cited in the file of this patent

UNITED STATES PATENTS

1,171,716	Haas	Feb. 15, 1916
1,706,736	Lumley	Mar. 26, 1929
1,879,358	Lilly	Sept. 27, 1932
2,687,120	Malec	Aug. 24, 1954
2,736,538	Barlow	Feb. 28, 1956