Aug. 11, 1931. M. KREHER 1,818,068

FLOATLESS CARBURETOR

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Fig. 1

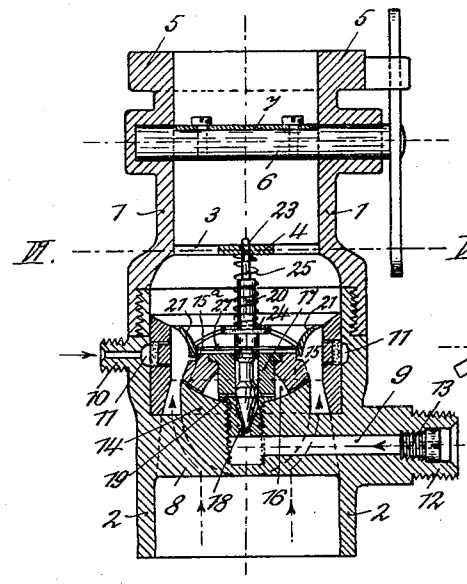


Fig. 2

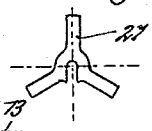


Fig. 3

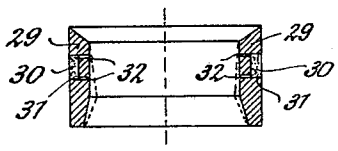


Fig. 4

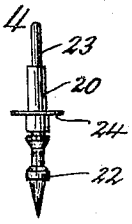


Fig. 5

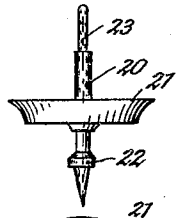


Fig. 5a

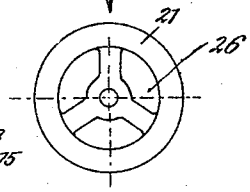


Fig. 6

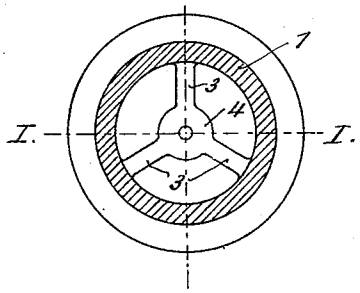


Fig. 7

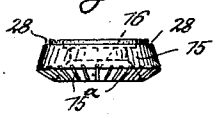
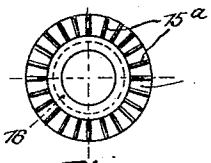


Fig. 7a



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Fig. 8

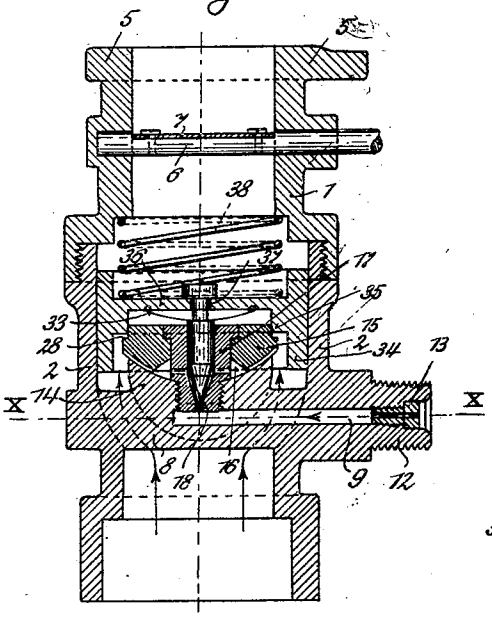


Fig. 9

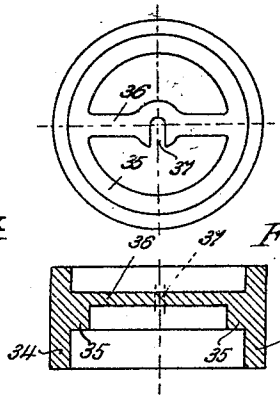


Fig. 9a

Fig. 10

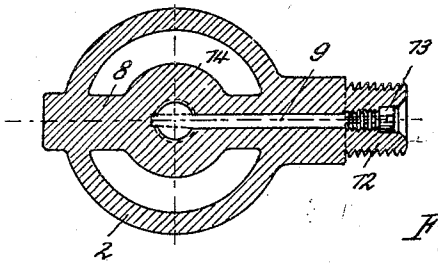


Fig. 11

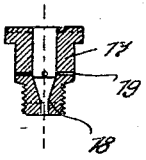
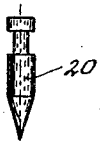


Fig. 12



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Fig. 13

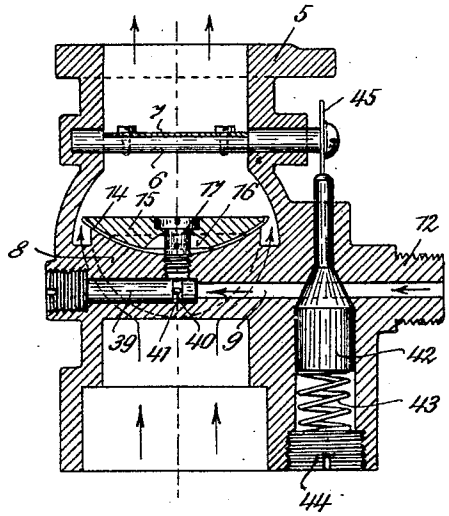


Fig. 15

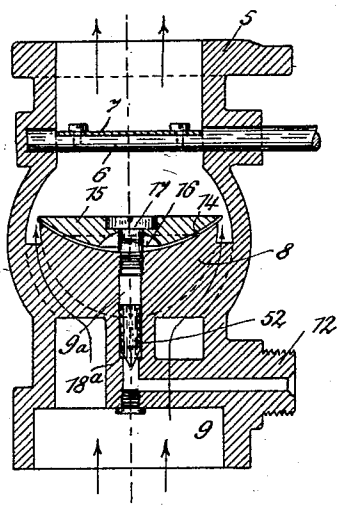
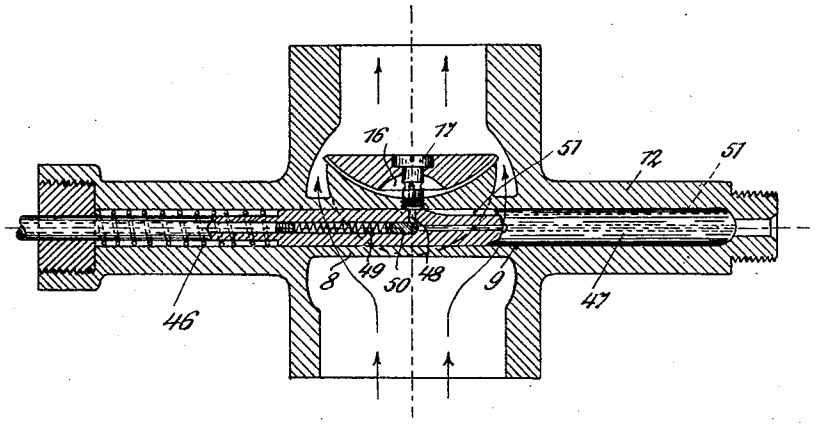


Fig. 14



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by [illegible]
Attorney

Patented Aug. 11, 1931

1,818,068

UNITED STATES PATENT OFFICE

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FLOATLESS CARBURETOR

Application filed December 10, 1928, Serial No. 324,995, and in Germany September 3, 1928.

Attempts have already been made to produce carburetors without floats, but these attempts have not given a satisfactory result.

A carburetor without float must have, if it has to fulfill the practical requirements, a special construction with accurate calculation of all points important and favourable for the working. It is believed that this invention represents a type of floatless carburetor which is an important improvement over all known types of carburetors and of great importance for use on motorcars, aircraft and the like.

Several embodiments of the invention are illustrated by way of example in the accompanying drawings in which:—

Fig. 1 shows the improved carburetor in vertical section, partly in elevation.

Fig. 2 shows in top plan view a three-armed blade spring to be used in combination with the regulating pin.

Fig. 3 shows in cross section a ring for supplying moisture to the suction air and for regulating the free cross-section of the passage for the explosive mixture.

Fig. 4 shows the regulating pin in elevation.

Fig. 5 shows in side elevation the regulating pin with mixing plate.

Fig. 5*a* is a top plan view of Fig. 5.

Fig. 6 is a cross section on line VI—VI of Fig. 1.

Fig. 7 shows in side elevation the benzine distributing element shaped like the rose of a water can.

Fig. 7*a* is a plan view of Fig. 7 seen from below.

Fig. 8 shows in cross section partly in elevation a carburetor of modified construction.

Fig. 9 shows in top plan view the interchangeable ring for holding the regulating needle.

Fig. 9*a* is a vertical section through Fig. 9.

Fig. 10 is a horizontal section through the fuel channel in Fig. 8.

Fig. 11 shows the benzine nozzle in vertical section.

Fig. 12 is a side elevation showing the regulating pin.

Figs. 13, 14 and 15 show each in vertical section a carburetor of modified construction.

Referring to Figs. 1 to 7 the carburetor casing is composed of two parts 1 and 2 screw connected with each other. The upper part 1 comprises a transverse bar 3 having three arms and a hub 4, (Figs. 1 and 6) said upper part of the casing having a flange 5 at the top end. In part 1 of the casing a shaft 6 with throttle valve 7 is journaled. The part 2 of the casing comprises a transverse bar 8 in which a channel 9 is bored. The casing has two tubular sockets, the tubular socket 10 serving for the admission of water and tapping into an annular groove 11, and the tubular socket 12 forming an extension of the transverse bar 8 and serving for the admission of benzine. A nozzle insert 13 is in the outer end of the tubular socket 12. The flange 5 of the casing is connected to the engine and the air flows in through the open lower end in the direction of the arrow lines.

On the transverse bar 8 a bearing brass 14 is formed in which an element 15 is inserted which I call a rose of a watering can. At the centre of the lower surface of the element 15 a cavity 16 is arranged from which extend in radial directions narrow grooves 15*a* over the lower surface to the upper edge of said element (see Fig. 7). The element 15 is fixed in the bearing brass 19 by means of a screw 17. This screw is bored and the boring communicates with the benzine channel 9. In the boring of screw 17 a valve seat 18 is arranged. From the boring of screw 17 extend laterally directed channels 19 to the cavity 16.

The screw 17 and a regulating needle 20 in the same form together the fuel valve. The needle 17 has, as shown in Figs. 1, 4 and 5, a shutting off plate 21 for the passage of the mixture. Its point bears against the seat 18 and it is guided with a collar 22 in the boring of screw 17 and with its upper end 23 in the hub 4 of the three armed transverse bar 3. Between a collar 24 of

the regulating needle and the transverse bar 3 a spiral spring 25 is inserted.

The screw 17 and the needle 20 are made of rust proof steel and one of the two elements (immaterial which one) must be tempered and the other not tempered. The shutting off plate 21 (Figs. 1 and 5) which is made of light metal and has apertures 26 in the bottom plate is loosely mounted on the regulating needle and coupled with this needle by means of a three-armed blade spring 27 inserted in said plate 21. The needle and the plate are adjusted together and in dependence of each other. The plate 21 is normally standing a short distance above an offset step 28 of the element 15.

The following has to be explained:

At misignitions shocks are produced directed into the casing; they would make the needle strike hardly against the seat 18 so that this seat would be widened. In the form of construction described the plate 21 will be pressed down by such shocks until it strikes against the offset step 28, whereby the blade spring 27 is put under tension and elastically brakes the shock for the needle 20.

In the part 2 of the casing a ring 29 is removably inserted, the inner diameter of which determines the width of the passage. By accordingly selecting the inner diameter of ring 29, the width of the passage can be adjusted in accordance with the actual strength of suction of the motor. Into the ring 29 (Fig. 3) an annular groove 30 is cut which registers with the annular groove 11 and contains a wick 31 which is continually moistened by the water flowing in through the tubular socket 10 and annular groove 11. From the bottom of groove 30 nozzle holes 32 extend to the inner surface of ring 29. The vacuum existing in the suction draft attracts the moisture from wick 31 through the holes 32 so that moisture is continually absorbed by the suction draft. The moisture is very little, only a moist vapour, but it has the effect to solidify the mixture.

When the motor is being started the throttle valve 7 is only slightly open, to be opened wider according to requirement as soon as the engine is running. By the suction draft produced by the engine the needle 20 and plate 21 are automatically raised and air is sucked through the channel 9. The benzine flows into the boring of screw 7, thence through the nozzle holes 19 into the cavity 16 to be distributed through the grooves 15*a*. At the upper edge of the element 15 the benzine, flowing out uniformly distributed, is drawn along by the suction air. This arrangement of element 15 ensures an extraordinarily fine distribution of the benzine and a very intimate mixing of benzine and air so that a perfectly working combustible mixture is produced. A thorough mixing is further favoured by the arrangement of plate 21. As the mixture flows around this plate 21 and through its apertures 26 eddying on the outer side is produced besides intersecting inner jets so that the mixture is thoroughly mixed again.

In the form of construction shown in Figs. 8 to 12 the regulating needle 20 carries with the aid of a blade spring 33 a ring 34 which has an inner shoulder 35 and a transverse bar 36 with a central cavity 37. The collar of the needle 20 is inserted into this cavity 37 and the blade spring 33 connects the two elements. A spiral spring 38 rests on the ring 34. This ring 34 is normally in such position that its shoulder 35 is a short distance above the offset portion 28. A shock striking against the needle is neutralized as the ring 34 is pressed down against the offset step 28, the blade spring 33 braking elastically the shock for the needle 20. In this form of construction of the carburetor the valve is also automatically opened by the suction draft as in the form of construction above described.

In the form of construction shown in Fig. 13 the casing is cast in one piece. The channel 9 extends through the transverse bar 8 from one end to the other.

Into this channel 9 a nozzle 39 is screwed, the boring of which communicates by lateral channels 40 with an annular groove 41. The benzine flows through the nozzle and through the annular groove to the central boring of screw 17. The valve is formed by a plug 42 mounted on a spiral spring 43. The valve chamber is closed at the lower end by a screw 44. The pin of plug 42 projects from the casing. The shaft 6 of the throttle valve is rotated by a two-armed lever 45 and the pin of the plug is on the path of one of the lever arms. The valve shuts off in the upper position. In this form of construction the valve is not opened by the suction draft but by depressing of plug 42 by means of one of the arms of lever 45.

According to Fig. 14 a bolt 47 controlled by a spiral spring 46 is situated in the channel 9, said bolt having a central boring communicating by a laterally directed branch 48 with the cavity 16 of the element 15. A bolt 50 controlled by a spring 49 forms a shutting off valve. The bolt 47 has further a groove 51 in its outer surface and it is connected to a pull element to be operated from the driver's seat. The spring 46 pushes the bolt 47 normally forward to shut off groove 51. In this form of construction the bolt 50 is at the starting of the engine first operated automatically by the suction draft formed in the cylinder and is moved back by the pressure of the benzine in the central boring of the bolt 47 against the action of the spring 49 thereby exposing the branch 48 and allowing

the benzine to pass from the boring of the bolt 47 to the branch 48. The bolt 47 is not displaced by the suction but remains in the closing position. For full running of the engine the bolt 47 is pulled to the left (Fig. 14) from the driver's seat so that groove 51 is made to communicate on the right end with the benzine feed bore in the part 12 and on the left with the cavity 16.

Fig. 15 shows the channel 9 cut in the casing and joining a vertical channel 9*a* in which a seat 18*a* is arranged for a valve body 52. The valve is lifted again by the suction draft.

I claim:—

1. A floatless carburetor, comprising in combination with the casing, a transverse bar in said casing having a boring forming a benzine channel, a bearing brass in said transverse bar, a rose-like head on said bearing brass for finely distributing the benzine, a screw for clamping said head on said bearing brass and having a central boring forming a passage for the benzine, a seat in the boring of said screw, a regulating needle in said boring bearing on said seat, a shutting off plate having apertures in its bottom loosely mounted on said regulating needle, and a three armed blade spring coupling said plate with said needle so that they are adjusted together in dependence of each other.

2. A floatless carburetor, comprising in combination with the casing, a transverse bar in said casing having a boring forming a benzine channel, a bearing brass on said transverse bar, a rose-like head on said bearing brass for finely distributing the benzine, a screw for clamping said head on said bearing brass and having a central boring forming a passage for the benzine, a seat in the boring of said screw, a regulating needle in said boring bearing on said seat, a shutting off plate having apertures in its bottom loosely mounted on said regulating needle, and a three armed blade spring coupling said plate with said needle so that they are adjusted together in dependence of each other the fuel and air mixture flowing around said plate and in jets through said apertures of said plate so that it is again intimately admixed above said plate.

3. A floatless carburetor, comprising in combination with the casing, a transverse bar in said casing having a boring forming a benzine channel, a bearing brass in said transverse bar, a rose-like head on said bearing brass for finely distributing the benzine having an offset step on its outer surface, a screw for clamping said head on said bearing brass and having a central boring forming a passage for the benzine, a seat in the boring of said screw, a regulating needle in said boring bearing on said seat, a shutting off plate having apertures in its bottom loosely mounted on said regulating needle, and a three armed blade spring coupling said plate with said needle so that they are adjusted together in dependence of each other, and a spiral spring resting on said transverse bar to equalize shocks resulting from misignitions.

4. A floatless carburetor, comprising in combination with the casing, a transverse bar in said casing having a boring forming a benzine channel, a bearing brass in said transverse bar, a rose-like head on said bearing brass for finely distributing the benzine, a screw for clamping said head on said bearing brass and having a central boring forming a passage for the benzine, a seat in the boring in said screw, a regulating needle in said boring bearing on said seat, a shutting off plate having apertures in its bottom loosely mounted on said regulating needle, and a three armed blade spring coupling said plate with said needle so that they are adjusted together in dependence of each other said screw and needle being of rust proof steel one of said elements being tempered and the other not tempered.

In testimony whereof I affix my signature.

MAX KREHER.