Nov. 6, 1951 A. C. KORTE 2,573,850

MEANS AND METHOD OF NEUTRALIZING THE GUM ACCELERATING EFFECT OF COPPER IN HYDROCARBON FUEL

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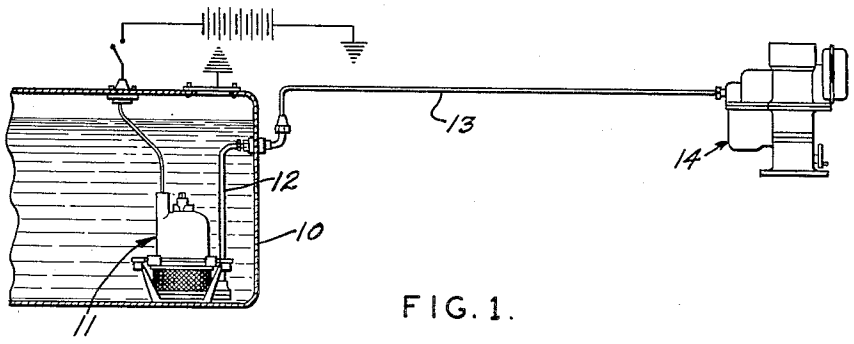


FIG. 1.

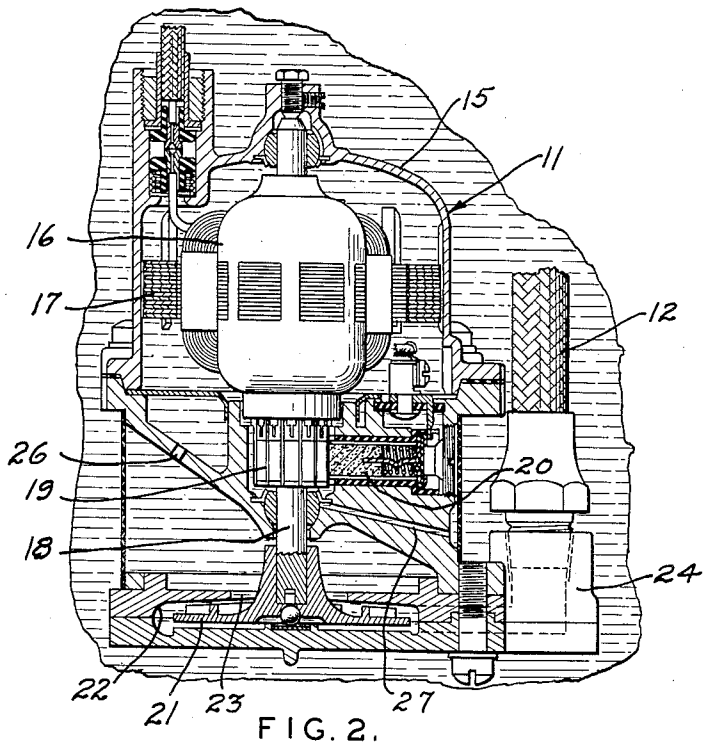


FIG. 2.

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MEANS AND METHOD OF NEUTRALIZING THE GUM ACCELERATING EFFECT OF COPPER IN HYDROCARBON FUEL

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Application March 18, 1946, Serial No. 655,223

2 Claims. (Cl. 44—50)

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This invention relates to means and method of inhibiting gum formation in hydro-carbons, particularly gasoline. This application is a continuation in part of my co-pending application, Serial No. 521,268, filed February 5, 1944 now abandoned.

Certain hydro-carbons, and particularly, gasolines of the cracked type, have a marked tendency to deposit gum, especially after the gasoline or other hydro-carbon has been allowed to stand for a considerable period of time. The tendency has a very serious effect where the hydro-carbon is exposed to or passes through intricate or minute devices and passages. For instance, in Korte and Lannert Patent 2,261,915, there is illustrated an electric fuel pump which operates wholly submerged in the gasoline fuel. It has been found that the deposit of gum about the commutator and other parts of the pump and motor seriously affect the operation thereof. Furthermore, it has been found that the presence of copper in contact with the gasoline, as in the commutator, has a marked tendency to accelerate or catalyze the formation of gum.

I have found that this gum-forming tendency can be substantially inhibited by alloying the copper with silver. A commutator formed wholly of silver would be fairly satisfactory except for the prohibitive expense thereof. Consequently, I have provided commutator bars, for submergence in hydro-carbon, formed of an alloy of silver and copper or silver, copper and cadmium with the novel result that the gum accelerating tendency of the copper is substantially neutralized or inhibited.

In the accompanying drawing which illustrates the invention,

Fig. 1 illustrates an automotive gasoline fuel tank having an electric fuel pump immersed therein, as disclosed in the above mentioned patent.

Fig. 2 is an enlarged section through the pump and a part of the tank and showing the commutator bars which are washed by the fuel.

In Fig. 1 the fuel tank 10 may be mounted in its usual position at the rear of the vehicle. The fuel pump, generally indicated at 11 is supported on the bottom of the tank and connected by tubes 12 and 13 to the carburetor 14 mounted in its customary position on the engine. As better seen in Fig. 2, the fuel pump comprises casing 15 which encloses an electric motor including armature 16 and field 17. The armature shaft depends vertically, as at 18, and mounts the annularly disposed commutator bars 19 against which bear the brushes, one of which is shown at 20. A centrifugal impeller 21 is secured to the lower end of the shaft within voluted casing 22. Fuel enters the top of the casing through a central inlet opening, or throat, 23 and is discharged laterally through the fitting 24 which connects with tubing 12 leading to the carburetor. Openings 26 and 27 are provided in the casing wall for admitting gasoline freely to the interior thereof for washing all of the motor parts, including the commutator bars. This form of pump is more fully disclosed and claimed in a co-pending application, Serial No. 473,683, filed January 27, 1943 in the name of the present inventor, now Patent No. 2,394,860.

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The commutator bars 19 are formed of an alloy containing 40% to 50% copper and 50% to 60% silver. I have found that silver alloyed in substantially equal proportions with copper, a normally inexpensive and superior conductor, will inhibit or prevent the otherwise marked gum accelerating tendency of the copper.

Obviously, the alloy can be used for other elements, customarily formed of copper, which are normally submerged in hydro-carbon.

The exclusive use of all modifications as come within the scope of the appended claims is contemplated.

I claim:

1. A fuel tank adapted to retain liquid hydrocarbon fuel, a fuel pump within said tank and operatively adapted to pump hydrocarbon fuel from within said tank to a point exterior thereof, an electric motor connected to said fuel pump and connected to electrical conduits within said tank, said pump, said motor and said electrical conduits being exposed to wetting by said liquid hydrocarbon fuel and being adapted for pumping hydrocarbon fuel even when submerged in said fuel, said motor and said conduits being characterized by having the portions thereof which are both electrically conducting and exposed to wetting with said hydrocarbon fuel formed of an alloy of between about 40% and about 50% copper and between about 60% and about 50% silver.

2. A fuel tank adapted to retain a liquid hydrocarbon fuel and an electric motor and fuel pump combination submerged in the hydrocarbon fuel in said tank, the electrically conductive elements of said motor being formed of an alloy consisting of from 40% to 50% copper and from 60% to 50% silver, whereby the hydrocarbon fuel in said fuel tank in contact with the electrically conductive elements of said motor is maintained free from gum.

ALFRED C. KORTE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
2,352,958	Lauer	July 4, 1944

OTHER REFERENCES

Kurnakow et al., Zeitschrift fur anorg. chemie, vol. 68 (1910) pp. 123–140. (Copy in Scientific Library.)