# The Line Shaft

*The Official Newsletter of the*

## NORTH JERSEY ANTIQUE ENGINE & MACHINE CLUB

**February 2013**

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***Founded on October 15th, 1979 by: Arthur Goble, Fred W. Westbrook, John Snook, Roy Bischoff & Lewis Quince***

We started our January meeting with 34 members in attendance. Ann Marie gave the Financial report for January and the start of a new year. For the coming year we discussed the idea of asking for a donation from event organizers who ask us to attend. It takes time and the cost of fuel isn't all that cheap. The money taken in could be used to offset the price of running our engines during the Fair. If there are any members out there who have experience with this, your input would be appreciated .

Another important question came up about members who would be willing to receive the News Letter thru their Email instead of a hard copy by Mail. If this would work for you , please see Ann Marie so she can load this information into her files. Anything we can do to cut cost would be great.

After the minutes were read, we were very fortunate to have Kevin Adams give a demonstration on the care and sharpening of High Speed Drill bits. Kevin works as a Machinist down at Picatinny Arsenal where he has acquired a lot of experience in drill bit sharpening . Kevin brought along his *Drill Doctor* to show us the proper way to set one up when sharpening a drill bit. Kevin made the comment, that if you intend to buy a Drill Doctor...invest in the more professional model. You can do larger bits and it will do a better job. Kevin also noted that a lot of the bits which are coming into the States are of extremely poor quality. If there are any members who would like a workshop on drill sharpening, please let Blasé, Jeff or Kevin know. **JB**

## REMINDER: 2013 DUES ARE DUE!

***Annual dues are $25.00 and payable at the February meeting or send to:***

**NJAE&MC-Anne Marie Adams**
**7 Gunn Rd.**
**Branchville, NJ 07826**

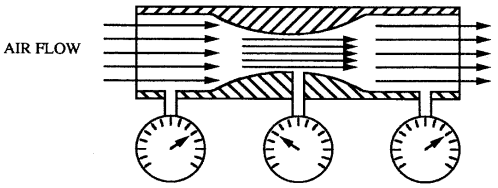
***Our next meeting will be 7PM at the administration building on February 14th 2013***

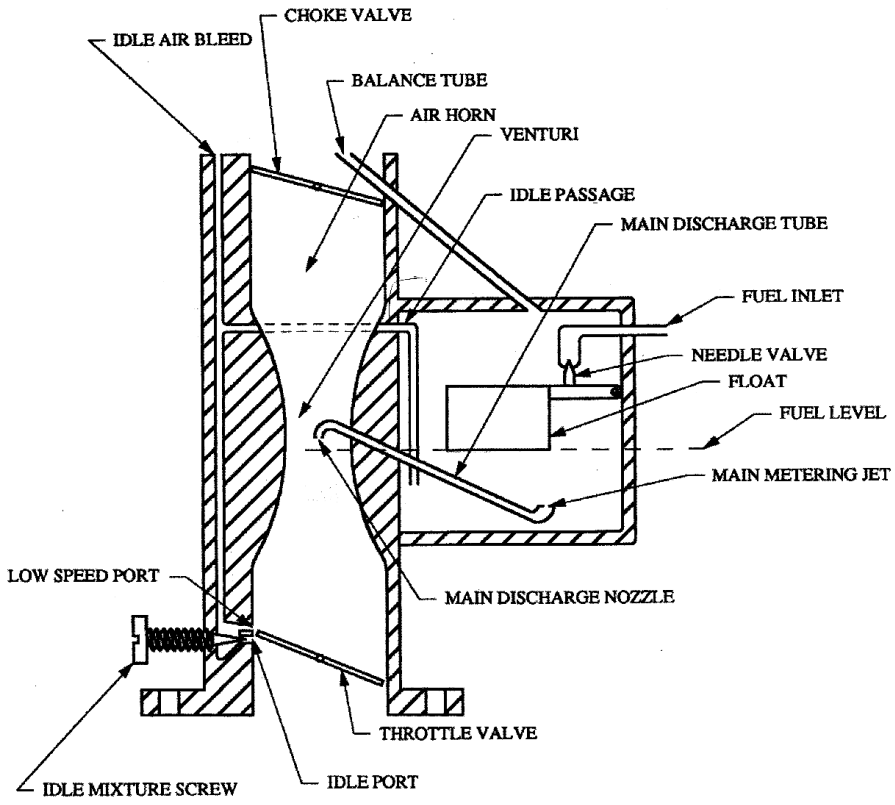
# The Carburetor

The purpose of the carburetor is to mix air and fuel, in proper quantities and proportions to meet varying speed requirements and changes in temperature and load, of a piston engine. In the process of this mixing, gasoline is atomized and vaporized, ultimately producing the correct air/fuel mixture for the fuel used.

***Of note, the intake stroke of the engines pistons create a partial vacuum and atmospheric pressure "pushes" the air toward and into that vacuum. The pull-push or pressure differential of air is what makes both the engine and carburetor function. For the purposes of this article we will simply say the air and fuel is drawn into the engine or carburetor, but in reality it is a pull-push effect that creates the motion of both air & fuel.***

The carburetor as we know it utilizes the Bernoulli Principle developed in 1738 by Swiss scientist Daniel Bernoulli. The principle states that *as velocity increases, pressure decreases* and the principle is used to create the lift in the wing of an airplane, allows a sail boat to sail into the wind and draws and atomizes the gasoline into the intake airstream of a piston engine. The venturi is the restricted (necked down) place in the air horn of a carburetor and is named after Italian physicist Giovanni Venturi, who in 1790 applied Bernoulli's principle to the flow of air and fluids. As the air is drawn from the intake and thru the carburetor and passes thru the narrowed down venturi it has to speed up (think rapids in a river) to allow the mass of air to continue to the intake manifold where it again slows down and the pressure rises (somewhat) before entering the cylinders. The velocity increase in the venturi causes a major pressure drop or low pressure area (Bernoulli's principle). Replacing the center gauge in the illustration above, which is presently indicating a vacuum, with a pipe leading to a gasoline supply will draw gasoline up and into the venturi and into the airstream.




Again, this is the job of the carburetor...delivering the atomized air/fuel mixture in the correct proportions to the cylinders of a piston engine, which is accomplished within the venturi, but requires a number of contributing circuits or mechanical components to work its magic. They are: the throttle valve, float, idle & low speed circuit, high speed circuit, choke, power enrichment circuit and accelerator pump.

The throttle valve meters the air flow thru the carburetor air horn and body and by this controls the speed of the engine.

The float circuit is involved in maintaining a relatively constant level of fuel within the vented float chamber or reservoir and its level can be used to lean or enrich the air-fuel ratio. It works much like a conventional toilet.

When the throttle valve is closed, there is less air movement within the venturi and the engine runs on the idle or low speed circuit. The lower speed air moving thru the air horn must increase in velocity to get around the edges of the closed or partially closed throttle valve and a vacuum or low pressure area is created at this point. Fuel is drawn from the float bowl via the idle/low speed circuit and a small portion of air is drawn thru the idle air bleed to increase atomization. The rate of flow at idle can be adjusted by the idle mixture screw.

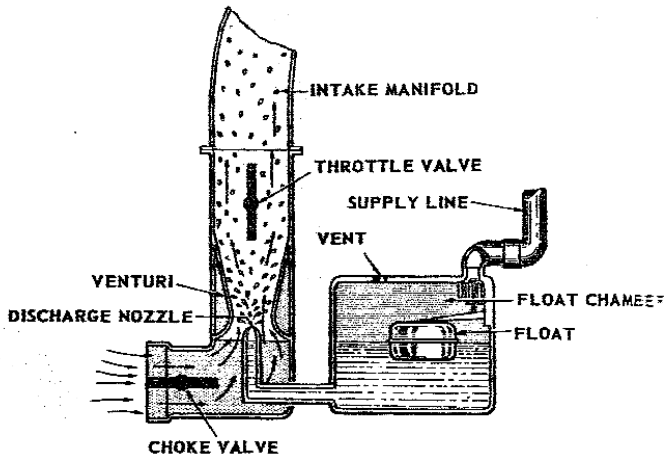
The high speed circuit brings the venturi into the system connecting the venturi directly to the float bowl via the main discharge nozzle and the pressure differential between the two floods the air stream with fuel.

The choke circuit is used to enrich the air-fuel ratio to produce enough combustible vapors to permit the engine to start in cooler temperatures.

The power enrichment circuit provides a richer mixture when the vehicle is under heavy load. It is not shown in the illustration, but can be controlled by the intake manifold vacuum or mechanically thru the use of a stepped or taped needle in the center of the main metering (well) jet or directly by a vacuum operated valve.

And finally we have the accelerator pump...which provides a squirt of fuel when we suddenly shift from the idle or low speed circuit to the high speed circuit. Without the extra fuel provided by the pump we would get a sudden lack of response or hesitation in the engine. This can also be controlled mechanically or by vacuum.

***A few interesting side notes: in 1896 German engine designer and automotive pioneer Wilhelm Maybach partnered with engineer-industrialist Gottlieb Daimler (Daimler Motors Corp.) and created the float-type spray carburetor...the precursor of the modern carburetor. The original design was for an up-draft carburetor, due to the flawed and mistaken reasoning that gasoline fumes rise...actually they settle downward and the down or side draft carburetors are more efficient and tend to start easier. The updraft is problematic on older engines that have lost compression and the "ability" to create a substantial vacuum. The fact that the up-draft carburetor allows for a lower engine profile and can better use a gravity-feed fuel supply are generally used as the reasoning for this design, but are actually after-the-fact pluses of what was essentially an engineering error. By the first decades of the 1900's Edward Butler (a Brit) had added the venturi and the Maybach style carburetor would be found on virtually all gasoline engines. Some, found on Model T Ford's and many farm tractors, contained steel or iron bodies, had no cork, rubber or soft metals incorporated into them and were intended for use with home-brewed alcohol fuels (Ethanol). These fuels were and are (most gasoline in the USA contains 10% alcohol...E10) very corrosive and were run full strength (now called E100) or in blends with gasoline or fuel oil and operated with the choke partially closed at all times to increase the fuels richness and reduce cylinder heat. These were the first FFV's...Flex-Fuel Vehicles...proving once more, that there is nothing new in this world. The carburetor would remain in use on US automotive vehicles thru the early 1990's and still is used on many smaller engines and in the automobiles, industrial, construction and farming equipment produced for 3rd and 4th world countries.***



# MARKETPLACE

**WANTED:** 14.9 x 24 used tire
CONTACT: Ken Reuter, 973-670-1646

**FOR SALE:** International Cub Cadet 102; repainted, just needs wire harness. $400 CONTACT: Paul Curcio, 33 Central School Rd., Wantage NJ 07461, 201-835-5924, PaulF350@yahoo.com

**WANTED**: Backhoes-Compact Tractors-Mini Excavators-Skid Steer Loaders-Cletrac & Oliver Crawlers-Farm Tractors-Small Dozers… in any condition. **"Top $ Paid"**
**CONTACT**: Robert Norman, 845-858-8242

## Buy-Sell...member to member!

**FOR SALE:** Steam bent ash hardwood walking plow handles;
high quality straight grain. $30 per pair.
CONTACT: Bruce Mitchell, 973-702-1012

**FOR SALE:** Premier Designs jewelry or host jewelry trunk show. Donations to NJAE&MC from sales.
CONTACT: AnnMarie Adams, 973-946-1726, AnnMarieBAdams@aol.com

**FOR SALE**: 2 ea. 154 International Harvester Low Boys; one ran 3 yrs ago when shut down, under tarp, has Woods 59 inch belly mower. 2nd tractor running, needs brake work, has rear mount 3 point hitch with hammer type mower attachment. Both with long personal ownership. For sale or trade for older Cub Low Boy with plow and/or attachments, or 8/9N Ford.
CONTACT: Charles Germershausen at cgermershausen@hotmail.com or call cell 1-973-214-5968. Tractors located in Florham Park, NJ.

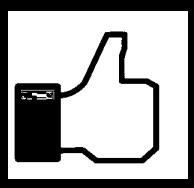
**WANTED**: Spare parts for 1917 Fairbank/Morse hit & miss engine. Ford Golden Jubilee steering wheel
CONTACT: Charles Germershausen at cgermershausen@hotmail.com or call cell 1-973-214-5968.

**FOR SALE**: 2 Goodyear 16.9 x 24 6 ply Industrial Sure Grip Tractor/Backhoe tires. Approx 40% tread. Good condition, great for spares. (These tires are $800 each when new) Asking $125 each or willing to trade for decent 11.2 x 28 tractor tires for Ford 2N.
CONTACT: John at 973-919-0369

**WANTED**: Parts for International M Hit or Miss Engine. Piston, sleeve, etc. needed, all parts considered.
CONTACT: John at 973-919-0369

**FOR SALE**: Air Powered Press and Brake - $300.00, Air Powered Transfer Pump - $200.00
CONTACT: Don DoNofrio - 973-627-3706

Check out our FACEBOOK PAGE!



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