



The Flightline



Volume 43, Issue 11 Newsletter of the Propstoppers RC Club AMA 1042 November 2013



President's Message

The indoor flying Nov. 1 went over well. There was a light turnout but we all had fun.
 Don't forget Nov.16th indoor at Brookhaven 6:30 till 9:00.
 Both fields are in good shape for flying.
 The November meeting is the time to accept nominations for club offices. If you would like to run now is the time to throw your hat in the ring.
 If you have some show & tell bring them in, want to sell something bring it in too.
 PS if the club owes anyone \$\$\$ see Pete will be at the meeting.

See you at the meeting.
Dick Seiwel, President

**Agenda for November 12th Meeting
 At Middletown Library;
 Doors open 6:00, meeting at 6:30**

1. Show and Tell
2. Membership Report
3. Finance Report
4. Nomination for Officers

INSIDE THIS ISSUE

- 1 **President's Message**
- 1 **October Meeting Minutes**
- 1 **November Meeting Agenda**
- 2 **Show and Tell**
- 3 **At the Fields**
- 4 **First Indoor of the Season**
- 5 **More Fun in the Sun and Wind**
- 9 **Yet Another Aeronautical Challenge**
- 10 **Heat Engines**

2013/14 Indoor Flying

Mike Black has once again secured the Tincum School gym for indoor flying. The dates are;

December 6, 2013	6:30 – 9:30 PM
January 3, 2014	6:30 – 9:30 PM
February 7, 2014	6:30 – 9:30 PM
March 7, 2014	6:30 – 9:30 PM

Brookhaven; Saturday nights 6:30 till 9:30 PM

Nov 16 2013
 Dec. 21 2013
 Jan 18 2014
 Feb 15 2014
 March 15 2014

Minutes of the Propstoppers Model Airplane Club 8th October 2013 at the Middletown Library

The meeting was called to order at 6:30.

14 members were present. The President, Secretary, and Treasurer were unable to attend, and the meeting was presided over by Jeff Frazier.

There was no treasurer's report; the minutes of the last meeting were accepted

The first indoor Flying session is to be at Tincum on the 1st November

The club picnic was a great success (the best ever?) and was enjoyed by club members and the church group. The weather was good, and a viewing area for watching the flying activities was provided for our guests. It was suggested that next year we might improve the car parking.

Show and Tell

Al Tamburo showed an OS Max 61 Engine, a rarity as it was fitted with a gearbox and a tuned pipe to swing a 20 x 8 propeller.

John Moloko showed some cockpit assemblies fitted with neat device for release from the fuselage.

Mick Harris for Dick Bartkowski, Secretary

Calendar of Events

Club Meetings

Monthly Meetings
Second Tuesday of the month.
Middletown Library
Doors open at 6:00, meeting at 6:30 pm.
Next Meeting; 12th November

Tuesday Breakfast Meeting
Tom Jones Restaurant on Edgemont Avenue in
Brookhaven. 9 till 10 am. Just show up.
Flying after in the summer at CA or Elwyn Field
10 am. Weather permitting.

Regular Club Flying

At Christian Academy; Electric Only
Monday through Friday after school till dusk
Saturday 10 am till dusk
Sunday, after Church; 12 pm till dusk
At Elwyn Field; Gas or Electric
Monday through Saturday 8 am till dusk
Sunday 12 pm till dusk

Indoor Flying

See page 1

Special Club Flying

Saturday mornings 10 am
Wednesday Helicopter evening in summer
Thursday evenings in the summer
Tuesday mornings 10 am weather permitting
after breakfast.

Check our Yahoo Group for announcements;
<http://groups.yahoo.com/group/propstoppers/>

Beginners

Beginners using due caution and respecting club
rules may fly Apprentice or similar models without
instructors at Christian Academy Field.
The club also provides the AMA Introductory Pilot
Program for beginners without AMA insurance.

Show and Tell

Al Tamburo showed his geared OS 60



John Moloko's cockpit showing the latch



Propstoppers RC Club of Delaware County, Pennsylvania.

Club Officers

President Dick Seiwell reslawns@verizon.net
(610) 566-2698

Vice President Jeff Frazier jfrazier@comcast.net
(610) 357-4557

Secretary Richard Bartkowski rbartkowski@comcast.net
(610) 566-3950

Treasurer Pete Oetinger
610-627-9564

Membership Chairman Ray Wopatek
(610) 626-0732 raywop@gmail.com

Safety Officers bgsteam@comcas.net

Eric Hofberg

Ryan Schurman

throttle152@hotmail.com

(610) 565-0408

Newsletter Editor davejean1@comcast.net

Dave Harding
(610)-872-1457

Propstoppers Web Site; www.propstoppers.org

*Material herein may be freely copied for personal
use but shall not be reproduced for sale.*

At the Fields



Late October has brought the usual brief period of perfect flying weather and the Tuesday breakfast group has been out in force to take advantage.

The farmer has removed his electric fence and Pres Dick Seiwel has kept the field in perfect shape.



First Indoor of the Season



Lou Yadevia flew this Albatross around the space and occasionally off the walls. Rugged little model!

"Good Hands" Al Basualdo flew this ultra-light small 3D with authority. The engineering on these models continues to amaze.

Ray Wopatek with P-40. He also flew the new Air Hogs Quad.



Larry Woodward has fitted one of these new "paper airplane propulsion unit" to a lightweight indoor free flight model. It flew great. What next Larry?

Dave Harding's "Proof of Concept" Planophore, a solid balsa version of Alphonse Penuad's World's First successful model airplane.



More Fun in the Sun, and Wind

Secretary Dick Bartkowski and I made our annual pilgrimage to the SAM Champs; this year in Boulder City, Nevada. The flying was once again held on the El Dorado Dry Lake. This is a modelers paradise as it is about 15 miles long and two or three wide, completely flat, and absolutely no vegetation on the lake bed. The surface is hard packed dry dirt.

Dick and I compete in five different electric powered Old Timer events, each with somewhat different rules but all are either climb for a limited time then glide, or, the Texaco events where the battery capacity is fixed as a watt-hour per pound of model weight and you can run the motor as long as you wish until the battery is exhausted.

I also took a large model, a 1938 Weather's Westerner that I planned to fly with a Brown Jr. engine of the same vintage but lack of preparation meant that one didn't come off.

But for us the meet started with the drama of our model shipping. This is the fourth time we have shipped our large box via Greyhound. We ship it Philadelphia to Las Vegas and it usually takes three to four days. Dick tried to ship it on the Sunday before the meet, but found Greyhound no longer works the freight centers on Sundays. So back on Monday and the box shipped. Meanwhile, I had traveled to my daughter's in the Los Angeles area planning to drive to Las Vegas on the following Saturday to pick up the box and get settled into our hotel. However, this time the box did not arrive in three or four days, indeed it still hadn't arrived as I was driving to Las Vegas. Sunday I picked up Dick and we checked again only to find it still hadn't arrived.

I had some of my models in California having left them there after this winter's meet in Arizona, but all of Dick's models were in the box together with some additional for me. But the Gods must have been with us because on waking Monday morning Dick called and found the box had arrived in the night. So off first thing for the hour round trip to pick it up then prepare for Monday's events.

Monday turned out to be an excellent day for weather; modest temperatures, slight overcast almost no wind and some thermal activity. Our first event was Spirit of SAM for electric powered Old Time Rubber Powered models. The event allows just four AAA NiCad batteries and anything else goes. Dick has been a perennial winner and he repeated this performance again. I placed second and our main competitor from Michigan third; a great start.

Tuesday dawned as a fine day but the wind was forecast to pick up by midday and then blow with rain through Wednesday. So we prepared for early flights with our Texaco models. Dick flew his trusty Record



Dick Bartkowski flies his SoS model on the El Dorado dry lake

Dick and Dave take 1st and 2nd place in Spirit of SAM on day 1.



Dick Bartkowski with the Record Hound he flew in Texaco. This pix from last year's Muncie Champs



Hound to an excellent 29 minute flight and was in the hunt. Our main competitor Jack Hiner flew early and managed a 37 minute flight but the meet organizer lucked out when flying just as the wind came up, apparently stirring up some great thermals. He flew for 39 minutes.

My big Stardust Special had been a troublesome model at last year's Champs and also gave me problems in Arizona and California in prior meets. But I fixed it at the end of the California meet and challenged by my West Coast eating, drinking and flying buddy to put up a one hour flight I did just that. Landing with 40% battery energy remaining. I was set for the Champs....or so I thought. But my on my first flight the model barely took off and only climbed on full power. This was not a good sign as LiPo batteries exhibit a steadily diminishing voltage through the charge and sure enough I had insufficient power to continue to fly in 19 minutes.

What was the problem? It had flown so well on its last flight. Was it the altitude?

Eldorado is at about 1800 feet and the California central valley about 1000, so maybe not. Well one thing we thought we could do was to increase the size of the propeller and draw more power. So we screwed around with various bits and pieces (my props are folders with separate blades and middle pieces so I can make a variety of sizes). So we tried a takeoff test with one but no luck. Next was to try the high power motor used in the same model for a different event and I installed it while Dick modified another prop but by the time we were ready the wind started to blow and we waived off for the next day and a half. So, Dick placed third and the competition second. So far it was a draw for the championship between Dick and Jack.

Another thought about the loss of performance was maybe the motor was overheated in the previous flight in California. During that flight which took place among storming thermals I had dived down to keep the model in sight. Subsequently, when powering up to climb again I thought I was out of battery. But when it finally came down I could see the folding prop, which we screw down so it doesn't fold (not allowed to by rule) the high speed dive folded it back against the landing gear blocking it from turning. My attempts to power up would have been against a stalled motor; a bad thing as they can draw excessive current in that mode. Dick suggested the ESC should protect against overheating, but for contest work I may have turned off that feature. In any event I sent the motors back to Steve Neu for service and they just called to tell me they will replace the rotor on that motor. The magnets are on the rotor and they will lose some of their magnetism when heated beyond the Curie point with loss of power resulting too.

Thursday turned out to be rather windier than we expected but flyable nevertheless. On this day we flew our bigger models with the high power setups. Dick and I both put in early flights with only fair results. Then Dick made two excellent flights resulting in Maximums ~ the Max is ten minutes and two out of three flights count. Get two maxes and you are in the flyoff.

I set out to make my second flight and the orientation was close to the sun. Somehow during the high power climb near the sun, I lost sight of the model and became disoriented for a couple of seconds. Upon reacquiring it I found it in a vertical power dive with something coming off. The subsequent attempt to recover resulted in the wings folding and the fuselage diving vertically into the hard desert ground, smashing the front end of the model and breaking the remaining fuselage in two. Yikes, this is the third West Coast Champs in a row where I have done this. Twice before with the Giant, now with the Stardust Special. This model must be snake bit, or maybe I am!

Anyway, Dick was in the flyoff and placed third. Jack took first place.

Friday turned out to be the best day of the meet; warm sunny weather with just a ghost of a breeze and thermals on and off all day. We would be really busy this day as there were several events to fly, but before that there was a good deal of trimming to do, and it was going to be a short day as we planned to quit at three allowing time to clean up for the banquet that evening.

In the August newsletter http://www.propstoppers.org/pdf_files/aug13.pdf I explained one of the events that would be held this day; Speed 400 Scale Duration for scale models of aircraft built and flown before 1943. This is another timed climb and glide event; three minutes climb, and glide to a 15 minute maximum; best two out of four flights wins, unless there is a flyoff then flyoff wins. Although this was not a Championship event I was attracted to build the model of the Russian TU-ANT-25. I also explained that one of the members offered a \$100 prize for such models built before 1914, and I described the construction of my Antoinette in the August and September newsletters; http://www.propstoppers.org/pdf_files/oct13.pdf.

Dave's 1400 sq. in. Stardust Special Texaco/LMR



I had flown the TU-ANT-25 several times at Christian and Elwyn fields. It was a handful, tip stalling from any tight turn or from a straight and level stall. The very high aspect ratio wing with very short tip chord is prone to that behavior. Sometimes modelers put washout into the wings to help the problem, but that spoils the low drag advantage of the high aspect ratio tapered wing. So I was fortunate to find that when properly trimmed in climb and glide with very gently wide turns it behaved like a sailplane; which was of course the objective. So that one looked promising. The Antoinette was finished ready to fly just before leaving for California. I was worried about the stability with the thin highly cambered wing and that awful tail. Furthermore, I couldn't get the CG enough forward for a sure fire first flight. I had visions of that flight just stalling into a pile of matchsticks. What to do?

Well, it may be a secret, or at least a lesser known fact, but us builders of weird airplanes have President Dick Seiwel to maintain an area of high grass at CA field. This is the standard location for those first flights and with a bit of luck you learn enough to progress out to the big field. And so it was. With one day to go the weather finally cooperated and late in the evening Mick Harris joined me for that maiden flight. The first two launches ended up in the grass; no harm no foul. But the model had shown promise of stable controllable flight so we moved out on the strip and tried again. Perfect; it flew like a sport model, so it was in the travel box that night.

Now, with a daughter and two granddaughters living in South Pasadena we visit often and I am now in many ways basically bi-coastal; have duplicate modeling stuff on both coasts. I have used my Spektrum DX7 almost exclusively in Pennsylvania for the last two years but on the west coast I used my older Futaba 2.4 system. All my new airplanes have Spektrum radios so I decided to take my old and much loved Futaba F8U radio now with a Spektrum module to California. So far so good but this now meant that not only did I need to bind each model to this "new" radio but I also had to make some flights to get the trims and settings. My practice with these climb and glide models is to set the trims for each flight mode on a three position switch. This way they fly essentially hands off in each flight phase. But this requires several flights to set, and this is what Dick and I set about doing.

We went out early and started the process but Dick began to worry about the trade of getting it perfect vs. crashing and ruining all chance of a good result. So with things about right it was time to make my contest flights.

Meanwhile, Dick began to fly his model in the basic Speed 400 class, making one fair



Dave's 1909 Antoinette in testing over the long grass at CA field prior to the Champs

\$100 prize in the bag. Contest officials "give me the money"



Antoinette and Tu-ANT-25 winners in Pre-1914 and Pre-1943 Speed 400 events

flight without thermals and one with to score a max.

I then made my first flights with the two scale models; both performed quite well, especially since these were the first full-up contest flights and both needed full time control inputs to make them behave. This is especially difficult at the top of a three minute climb when the models are almost out of sight. The second flights were excellent the Antoinette flying for 9minutes 45 seconds and the TU-ANT-25 for a 15 minute max.

Now I thought the Speed 400 Scale Duration events were separate from the basic Speed 400 one, so what was important was to score better than the competitors in the Scale event. With the two flights on each model I had achieved that so put them away as I had won both events including the \$100 prize. But I had run out of time to fly my basic Speed 400 model, a winner in many previous contests, I was not in the running for the Championship anyway so that was ok. But to my amazement I find I took fifth place with the TU-ANT-25 as they counted it in the basic Speed 400 class! Had I known I might have put in another flight.

But there was another event we both flew, one that was postponed to Friday because of the bad weather earlier in the week. This was the electric Wakefield event for electric powered models of the old rubber powered Wakefield free flights. We both had old reliable and very competitive models but not much time to fly. Mine also required the trim flights to set the transmitter. Both of our first flights were modest, but we both re-flew in good air to score a max. But we were running out of time and Dick suggested we find two timers and fly simultaneously which we did. He flew for a

second max. I didn't know my timer so I thought I would hand launch myself. In hindsight, something I have never done in all the years I have flown this model. It flies fine but is quite a handful to establish the right climb profile. Dumb idea; the model left my hand and immediately turned and dived into the ground before I could get on the sticks! End of that event for me. But Dick won and I was third, so not so bad really. Our main competitor Jack Hiner was third. Shown here are Dick and Jack with their Wakefields.



Dick and Jack Hiner with their electric Wakefields. Dick won Dave second

Dick ended up just three points out of being the Electric Champion taking second place.

So at the end of it all Dick and I agreed we had a great time and all the effort was worth it.

Next year our team of Dick, Chuck, Tina and west coast buddy Colin Widdison will manage the week long Champs at the AMA site in Muncie.

Dave Harding

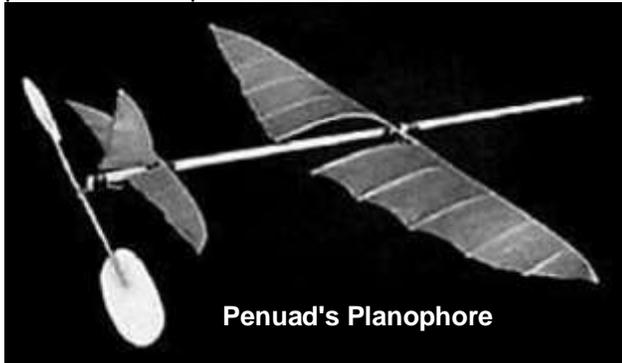


Dick takes second place in the Electric Powered Championship. Just three points out of first.

Yet another Aeronautical Challenge

For the last ten years I have been competing at the Southwest Regionals SAM contest in Eloy Arizona, about half way between Phoenix and Tucson. Anyway, I just heard they are holding a special free flight event this year for Alphonse Penaud's Planophore model.

Alphonse Penaud is credited with the first successful model airplane flight when he flew his rubber powered Planophore model over a distance of 141 feet in 11 seconds in 1871 at the Tuileries Garden in Paris.

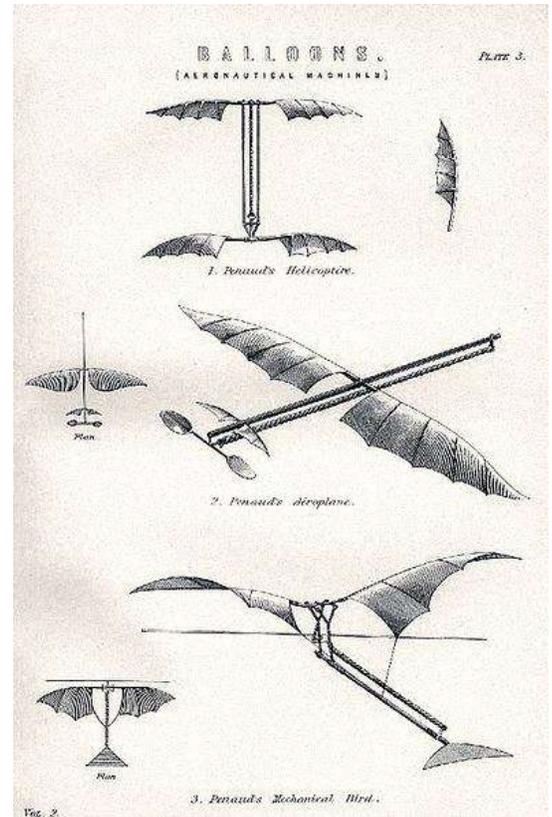


When I expressed interest in the event on the SAM chat group one of the members from Seattle told me he built one but couldn't trim it into stable flight. He said he thought it might be the pusher propeller. I told him pusher props are stabilizing; he was not amused!

What to do? Yikes, just realized it is our first indoor meet this evening, an ideal place to try something like this. So thinking I was only building a proof



of concept model (even though it had been already proven 142 years ago). It would be easy if I could make it from solid balsa and use some of the parts from one of those dime store all balsa rubber models; I have the parts. So I built it in a few hours before the meet and flew it late in the evening. At first it was way tail heavy due to the plastic prop, but adding more and more modeling clay to the nose brought it into trim and I achieved two magnificent flights. Aero design proved. Now to build a proper one with all the original materials, balsa, bamboo, piano wire, tissue paper and cotton thread and do some more testing before launching off to Arizona.



Heat Engines

This is a repeat of an article I wrote for the 2002 newsletter following a stay in London and visit to the Science Museum. Since some of our members are once again flying glow and gas engines and most of them have not previously seen this so I thought it appropriate to re-publish it. This is the first part of two or three. Watch this space.

Last flight of the day, switch on the juice pump and put in another ten ounces of Powermist finest. Reach for the glow driver and crank the starter. Immediate response from a burbling exhaust sound and a slowly humming prop. Houston, we have ignition.

Ignition? Powermist, Glow Driver? What is going on here, we just want to fly an airplane.

Heat engines, that's what!

Heat engines? What's that? Well, heat engines turn heat to useful work.

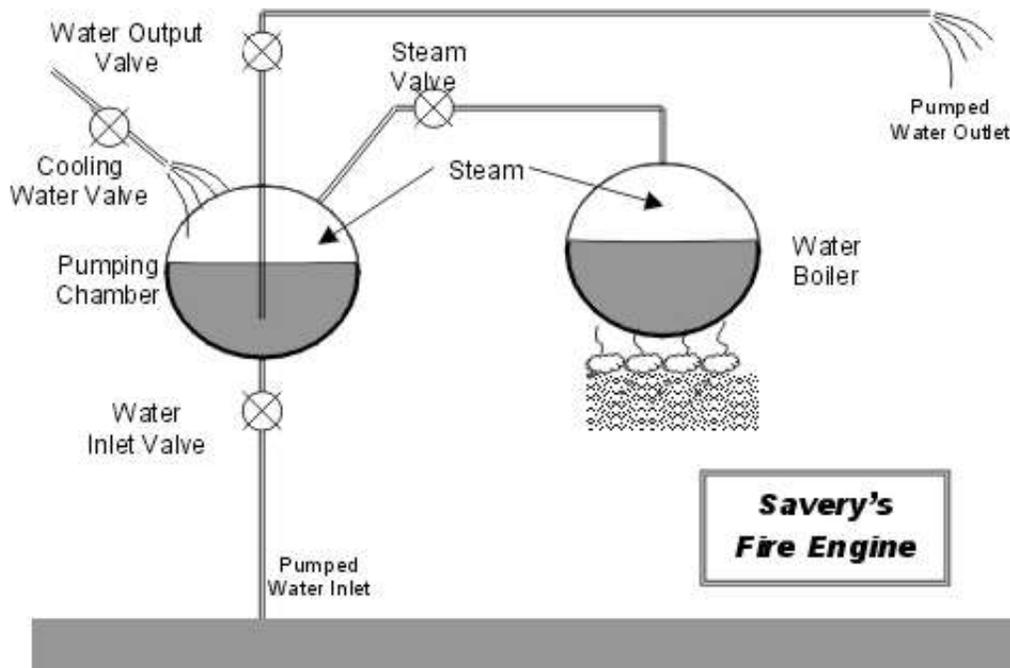
Motive power or working energy sources have been sought and developed to help mankind for centuries. The motivation for early heat engines was in the need to keep water from flooding mines; real commercial motivation here. As mines were dug deeper this became a major problem.

"In many cases, the cost of drainage left no satisfactory margin of profit. In one mine, 500 horses were employed raising water, by the then usual method of using horse gins and buckets".

The Heat Engine is the term we apply to devices that burn a fuel to make heat that is then converted to useful mechanical effort.

The first practical Heat Engine was patented by, Savery, an Englishman, in 1698 and put in use in the early 1700's. It worked exactly like the high school experiment where water is boiled to steam in a metal can which is then tightly closed. In high school the can cools and then collapses.

In Savery's "Fire Engine", steam is generated in a boiler and admitted to the Pumping Chamber via a valve. When the chamber is full of steam the steam valve is closed and the water input valve opened. Spraying water on the outside of the can cools steam in the chamber. The can or chamber then sucks the water by virtue of the vacuum formed when the steam condenses. Then the steam and water outlet valves are opened admitting more steam that pushes the water out. This process is conducted continuously to pump the water. Thus, the fuel burns releasing energy that pumps the water: a Heat Engine



During the entire development of heat engines three attributes have driven development; efficiency, weight and cost.

The efficiency issue; how much fuel is burned, drove the first major improvement to Slavery's engine.

In 1712 Newcomen, another Englishman, devised an engine where the steam was injected into a cylinder fitted with a piston. Injecting water into the steam-filled cylinder condensed the steam. The piston was connected to a beam that in turn was connected to a mechanical pump. This was the first engine mechanically connected to the output means. It begins to look like the familiar single cylinder / piston heat engine although the output was an oscillating linear motion rather than rotary.

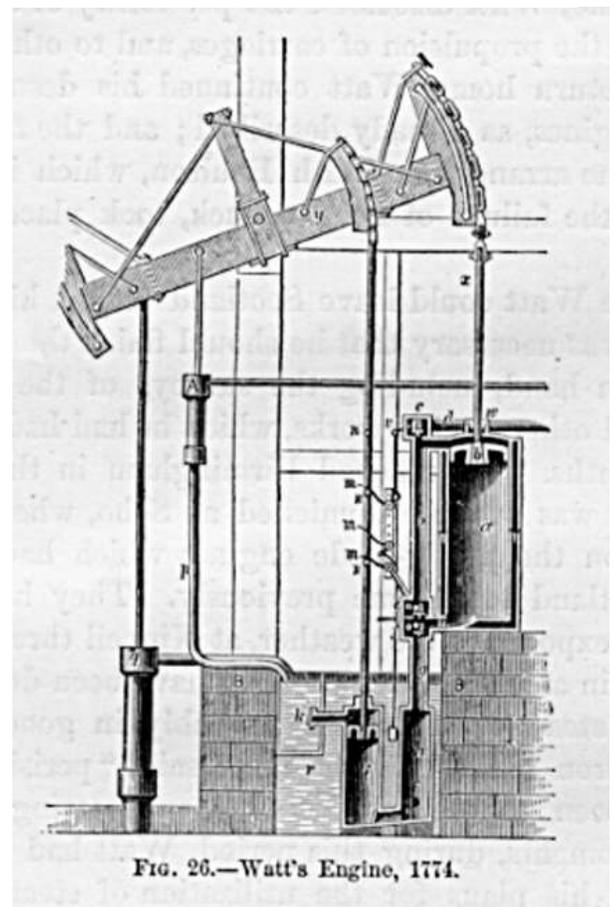
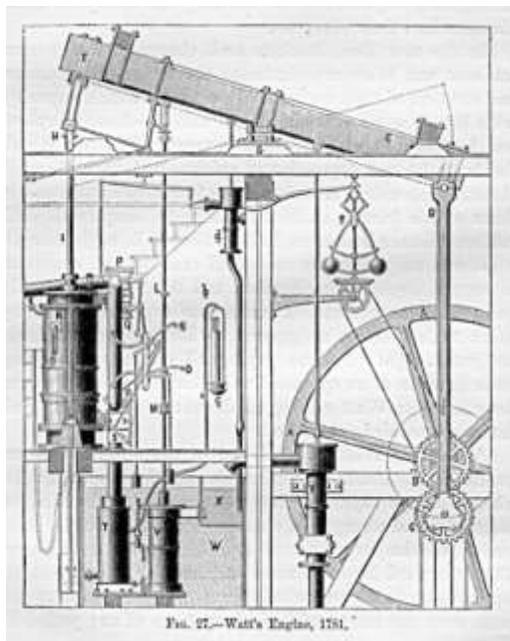
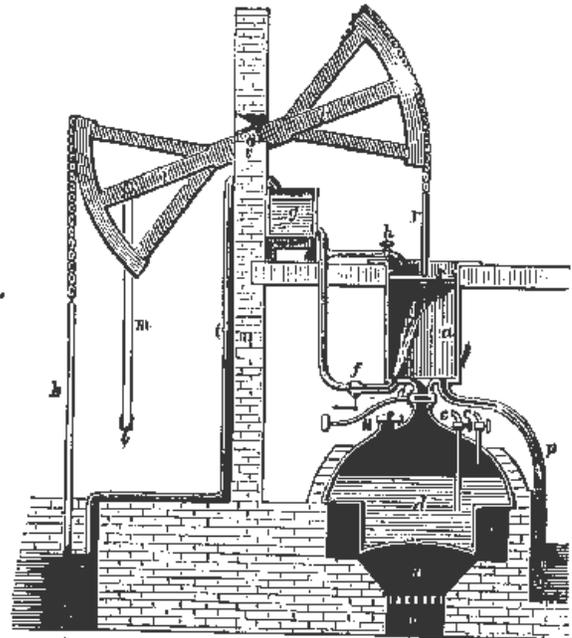
The next invention was also made in the interests of efficiency when in the 1770's James Watt, a Scotsman, recognized that the successive heating and cooling of the entire cylinder and piston assembly was wasteful. He devised an engine where the condensing of the steam was accomplished in a separate chamber. This chamber was connected to the cylinder via valves that alternated with the input of steam to the cylinder. The condensing chamber was continuously cooled by immersion in water and condensed water evacuated by means of a vacuum pump. Opening the valve between the condensing chamber and the cylinder sucked the piston down.

Having produced a more efficient pumping engine Watt then turned his attention to rotary output. He developed the familiar crank mechanism proposed by others but when an accomplice left his employ and patented the mechanism the furious Watt invented an alternative one.

This employed a gear on the crank and another on the connecting rod to produce the rotary output by epicyclic motion.

Thousands of Newcomen and Watt's engines were built; they literally powered the Industrial Revolution. So successful were they that Watt and his associates concentrated on

refining the basic design rather than looking for the next great step although many significant improvements were made including the double acting cylinder where there is a power stroke in both directions. Some of these engines ran continually for over 100 years.



All of the foregoing engines were known as atmospheric. This is because the working pressures are lower than atmospheric ie. vacuum. The pistons were sucked down. The use of pressurized steam was deemed unnecessary and risky. Watt's boilers produced steam at only six or seven pounds per square inch so they could be made using simple processes and materials and they were relatively safe. Others saw the advantage of high-pressure steam and exploited it.

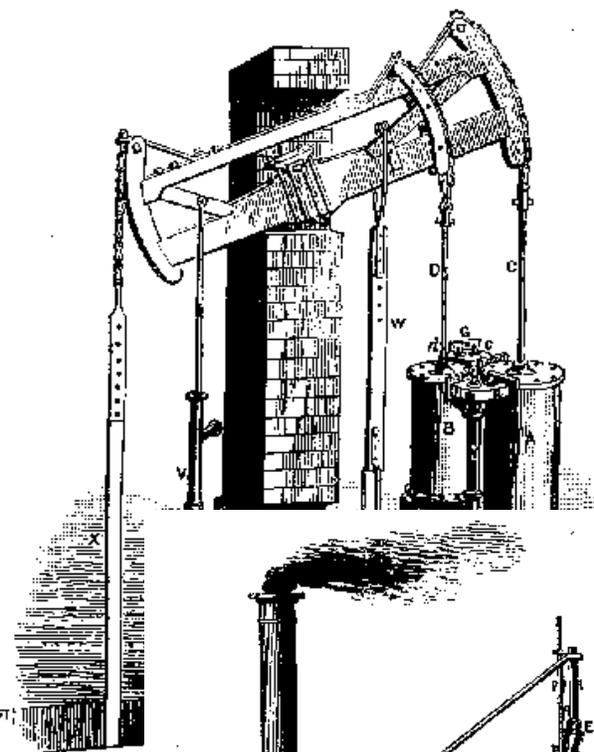
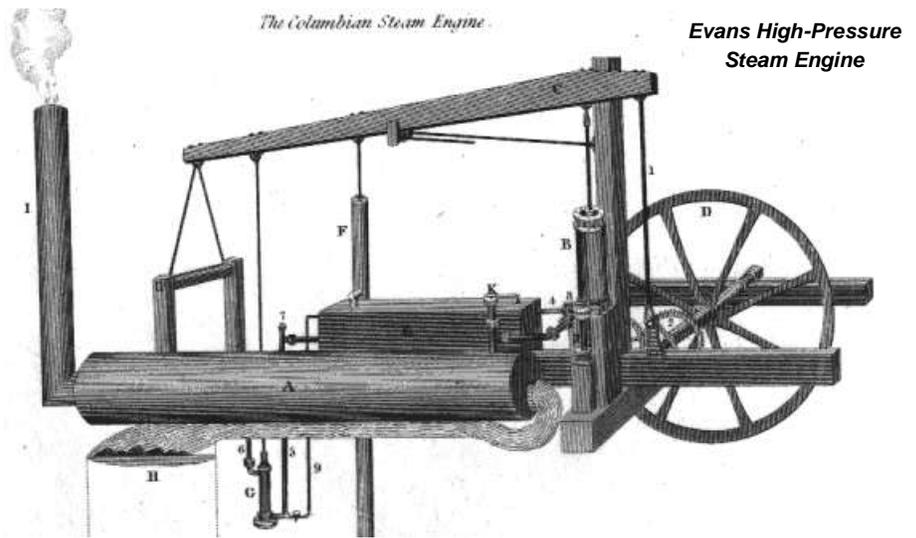
Oliver Evans from Newport Delaware, a farmer's son, pursued the development of high-pressure steam engines with compound cylinders. That is, the primary, or high-pressure cylinder exhausts into a second or low-pressure cylinder. Thus the high-pressure steam is expanded more completely in two stages.

The use of high-pressure steam meant that the cylinder and piston could be very much smaller and lighter than those in an atmospheric engine. His initial engines used steam pressure of 150 pounds per square inch, more than ten times higher than the conventional Watt engines. Consequently his engines were dramatically smaller, lighter and less expensive. However, impressed by this apparent efficiency Evans deleted the condenser used in all Watt engines so his thermal efficiency was no better. To do a fixed amount of work the same amount of coal was required as the Watt engine.

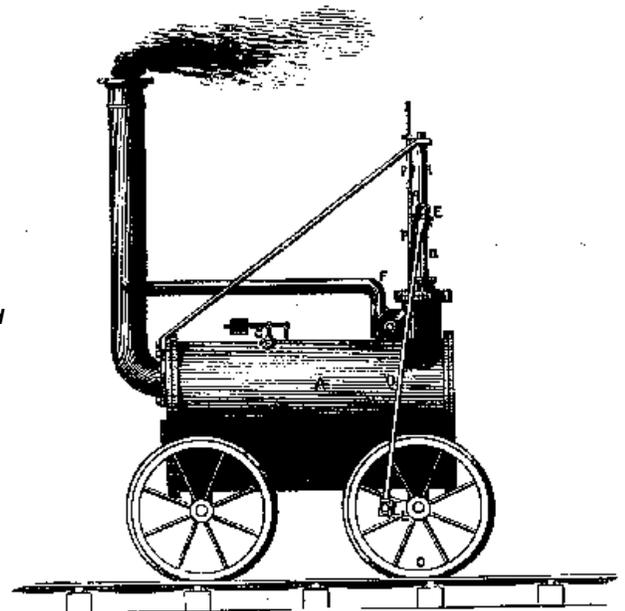
Nevertheless, Evans was very successful. His crowning achievement was the construction of the engine and boilers for the Fairmont Park Waterworks in 1818. This engine had a bore of twenty inches, a stroke of five feet and operated at a pressure of 200 psi. It was fired by four boilers. Imagine the coal consumption! Barged down the Delaware from the Scranton coal fields?

Simultaneous with Evans, an Englishman, Jonathon Hornblower, developed a high-pressure compound engine and his did have the condenser. Although he failed in his attempt to market the engine because of patent difficulties with Watt, another Englishman, Richard Trevithick perfected the approach and went on to build some of the first successful locomotives.

High-pressure steam was the key to powered vehicles and vessels, which rapidly flourished following this invention. Evan's engines were used in early motor yachts.



Trevithick's High Pressure Compound Engine

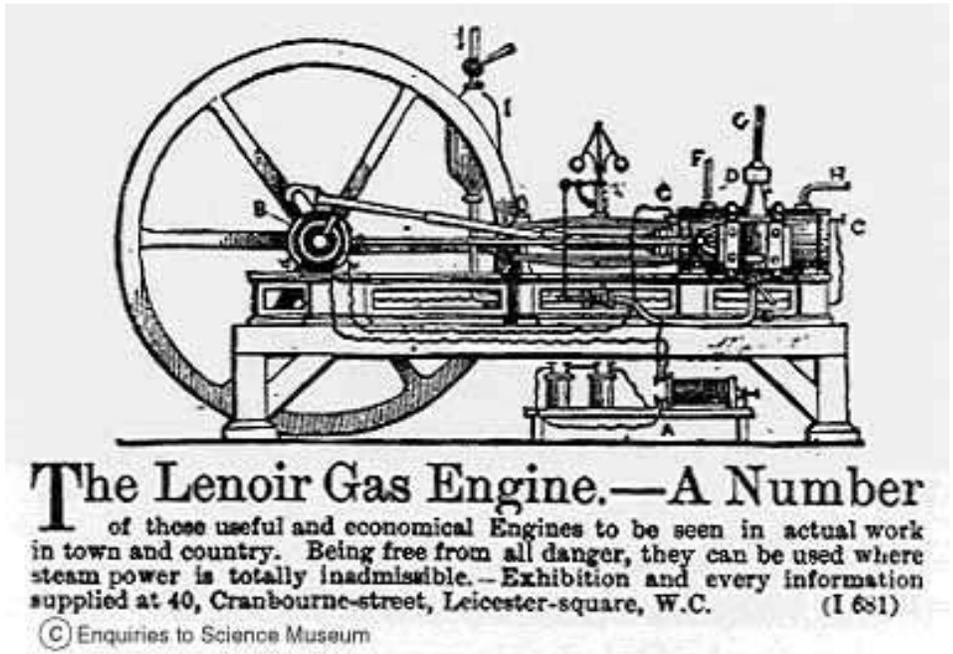


The steam engine today is just a very refined version of these engines with the same basic arrangement although with much higher pressures and temperatures.

The steam engine burns its fuel outside the working mechanism incurring thermal losses. This results in inefficiencies that led inventors to consider engines that burn their fuel internally;

The Internal Combustion Engine.

Although there were a number of experimental engines the first successful internal combustion engine was the French Lenoir of 1860. This double acting cylinder engine was run on coal gas (lighting gas). It drew the gas mixture into the cylinder on descent, igniting it before reaching the end of the travel. The spent gases were exhausted on the next stroke, so the engine was essentially a two stroke but different from those you are familiar with. Being basically an atmospheric engine, the pressures were low. These engines were very inefficient but they were simple and clean. Several hundred were sold.



The German Nicolas Otto made the real breakthrough in Internal Combustion Engines in the 1870's by inventing the four-stroke cycle.

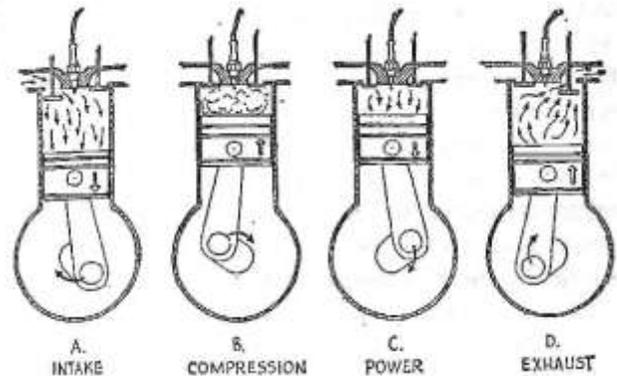
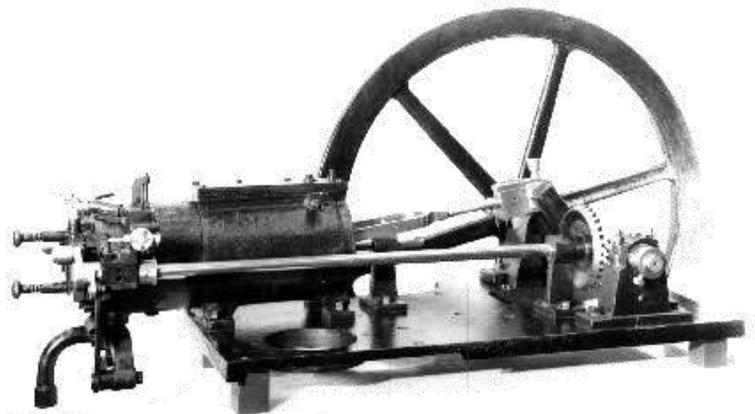


Fig. 43. The Otto cycle

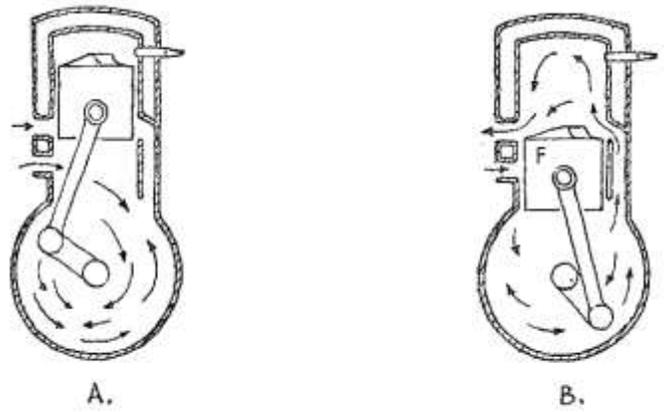
Here is one of Otto's early commercial single cylinder engines. Basically the same layout as the modern automobile engine. By the time of his death in 1891 more than 30,000 of his engines had been built.

Otto's Four-Stroke Engine

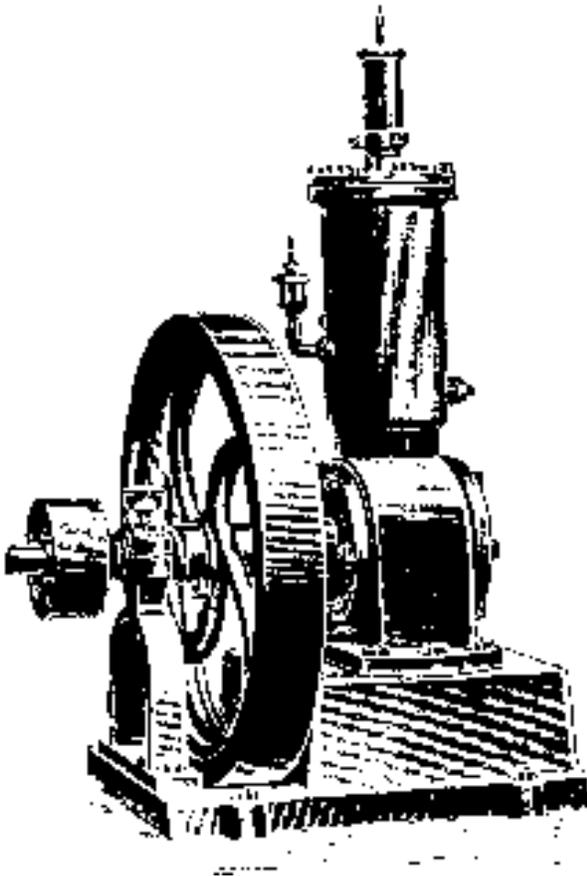


The disadvantage of the four-cycle engine is that it produces power only on every other stroke so in 1878 Sir Dugald Clerk of Scotland invented the two-stroke engine that in turn was further improved by Joseph Day in 1891.

This two-stroke layout is lighter and simpler than the Otto cycle four-stroke. It is basically the two-stroke engine we know today and use in our models.



Two-stroke cycle gasoline engine



Day's Two-Stroke Engine

So now you know. Gentlemen, start your heat engines!

Dave Harding

Part II Aero Engines next month (unless you swamp me with newsletter material).