Dummy engines for small scale models

1912 Avro F peanut with static prop

Following questions from fellow members about dummy engines in my models, I decided to write this short article, hoping it will serve as an inspiration or a starting point for anyone who wishes to try something more detailed.

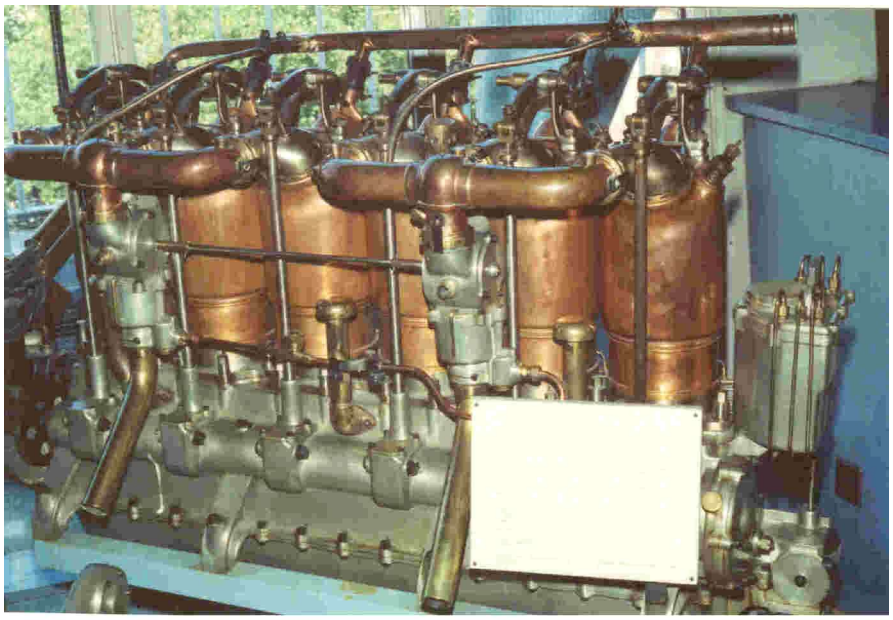
I am by no means an “expert”, I do have some techniques and info I could share, which might be of help, mainly for small rubber and CO2 models. Sometimes what works for one is useless for another. The readers will have to find the best by themselves.

My own first steps for dummy engines were based on Bill Hannan’s “Peanut Power” book, an inspiration for peanut models and scale free flight in general. Practice and experimenting afterwards helped build up some experience and at some point I realized that nearly every type of engine was feasible. It only takes time and patience. And a little more time.

More or less every airplane has an engine or parts of it exposed. I like airplanes mainly from the pre-1914 period, when everything was visible, even the pilot's socks…Most of the models I have modeled as "serious" projects had an exposed engine visible. I feel it adds a lot to the model's character, it draws attention and is perhaps the only place where extra detailing really pays off, even in an otherwise simple model.

The first step towards creating a detailed dummy engine, is to know what you are building, i.e. the actual engine itself. Good documentation is the key here, and the starting point for everything. A good drawing is necessary, as are pictures, preferably in color and at various angles. For old types this may seem impossible, but it is amazing what can be found through Museums. My personal experience with the Science Museum of London and the N.A.S.M., to name only two, turned up unexpected results for very rare types.

After finding a drawing, resizing it to the actual model size is the next step. Photocopiers or scaning-resizing-printing are two quick ways to go, that save unnecessary calculations.
Photographs are necessary for two reasons, first they give a better view of the powerplant and it's components, second they show the colors of the various components. This variety of materials and colors is what makes an engine look real, instead of a one-tone metal grey or gun metal. Even on black and white, one can see darker cylinders, polished copper intakes, black exhaust etc.

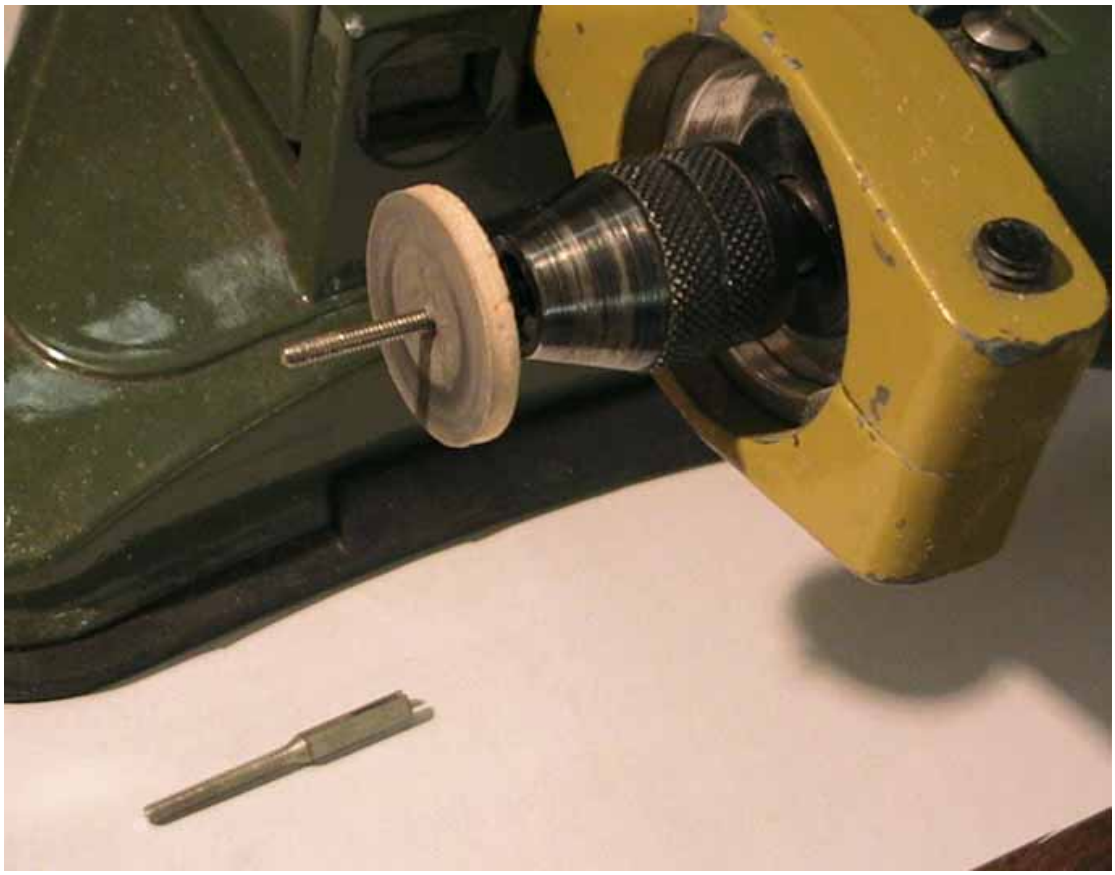


Real engine (Beardmore I think) at the Science Museum of London. Full of various parts, screws etc.

Next comes the first real difficulty. You have to think out the major components for the dummy and how to make them as raw components.You have to take away all the minor stuff and think only in terms of main "volumes".Usually the crankcase will be the main component to which the cylinders will attach, just like the original. Next

come the various cylinder head covers, manifolds, pushrods, manifolds etc. When you reach the sparkplugs, you are on the right track.

For all the major components, balsa is my best choice. We are talking about some volume, so considerable weight can be added with other materials. Balsa is great to shape and to sand. The only drawback is the grain, but this can be filled with thin coats of dope and in-between sanding.
For all cylindrical components it is necessary to turn them on a “lathe”. Don’t think big, a simple Dremel with a suitable (?) chuck will do fine. Mine are very simple, an RC pushrod end (?) with a balsa disk glued on and sandpaper on it.


Turning base for balsa components

I take the oversize balsa block, drill a hole slightly smaller than the rod thread, put a very small quantity of Cyano inside the hole and screw it into the rod, making sure it doesn’t get stuck. This way a thread is formed and the block is firmly screwed to the drill. Now it can be shaped with a variety of tools, an X-acto knife (carefully, with goggles and never against the direction of rotation) and sanding blocks, emery boards or any other suitable tool. After the shape is achieved, the surface is doped 1-2 times to seal the pores. Large areas can even be covered with tissue for that purpose. (Green crankcase).
For the connection of cylinders to the crankcase I always try for a mechanical connection in addition to glue. A bamboo or hardwood peg that connects the two parts. This way is very safe for crashing shocks. The same applies to all connections. A small dowel coming out of a cylinder is always pushed in a hole, to make a stronger connection, not just glued on the surface.