

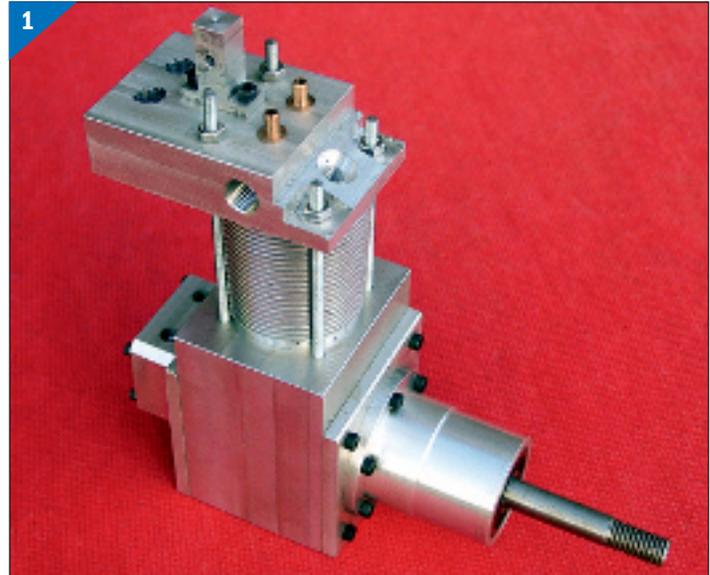
# A new Spark Ignition System for I/C Engines



DAVE FENNER

**Dave Fenner** looks at an inexpensive option.

One of my current projects is an own design single-cylinder 25cc 4-stroke, the progress to date being shown in **photo 1**. Assuming it is successful and, if the editor approves, it may appear in these pages in the future. One of the questions to be addressed is the means of ignition. From a 'simplicity of build' point of view, the easy answer would appear to be the tried and tested glow plug. All that is needed is a 1.5 to 2-volt power supply for starting, after which, the engine becomes self-sustaining. However, whereas on a miniature diesel, a combination of variable compression and fuel setting gives some control over ignition timing, a glow motor, once assembled, offers only fuel variation. If the compression ratio must be changed, then the usual technique is to change shims under the head. Many years ago, after building the Jones 605, I found it just would not run. It turned out that my water-cooled head modification



*My own design 25cc 4-stroke is gradually taking shape.*

gave too much compression. After reducing the ratio to match an OS 40 engine, the Jones burst into life at the first attempt. It may also be noted that to obtain the best power output on a particular fuel (nitromethane content) the compression ratio will probably need to be changed to suit.

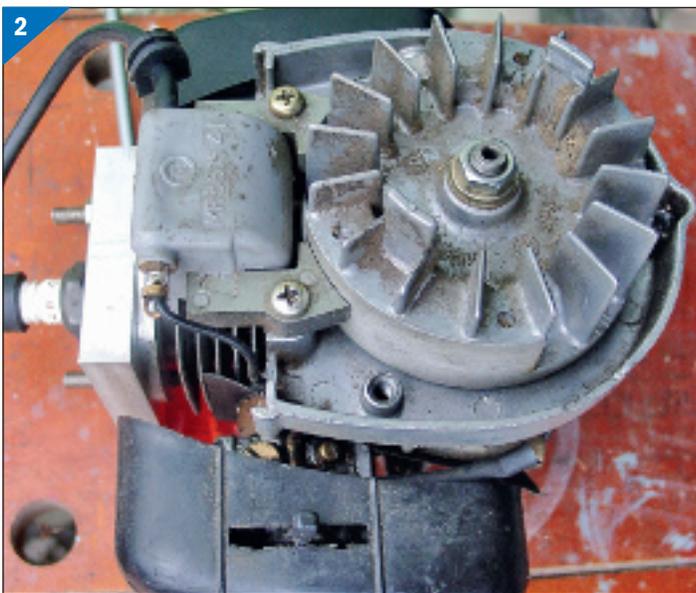
Spark ignition on the other hand generally allows the ignition timing to be set without reference to fuel mixture or (within limits) compression ratio. The down side however has tended to be the added weight of the system.

**Photograph 2** shows a small commercial two stroke with a built in magneto. This is similar to what will be found on devices such as strimmers, chainsaws, leaf blowers etc. The spark is generated by a flywheel mounted magnet passing the coil assembly. The flywheel has a diameter of about 10cm and also has significant mass. While this type of engine might be satisfactory for model cars or boats, it is likely to be too heavy for an aircraft.

Historically, miniature magnetos were available for model engineers, manufactured by Jim Shelley under the Minimag name. Jim (now 76-years young) has now retired and these are no longer made. Jim does, however, hold a number of spares although not coils. He also still has the business assets including stock, coil winder, potting equipment etc. Should any reader be interested in taking up this business opportunity, then Jim's contact number appears at the end.

Battery-coil systems were the norm for many years, using a miniature contact breaker; basically the same technology as cars and motorbikes of that earlier era.

Hall effect sensors now allow switching by the proximity of a magnet and a system comprising ignition kit and coil triggered by this means has been offered for some time by Hemingway kits. I believe this set was advocated by Nemett, for use on the Nemett NE15 ohc engine published in *Model Engineer*.



*Commercial 2-stroke with magneto ignition. This was resurrected by fitting a new piston, liner and head.*