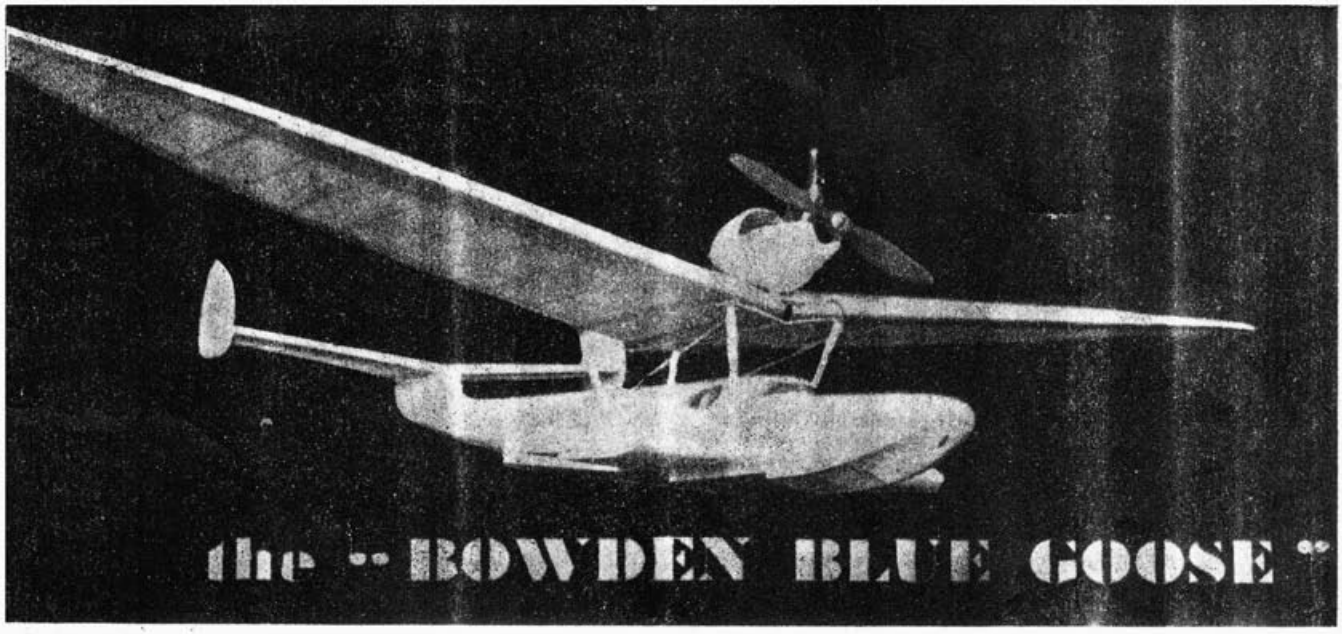


the "BOWDEN BLUE GOOSE"

By C · E · BOWDEN A.M.I. Mech.E.

The Problem.

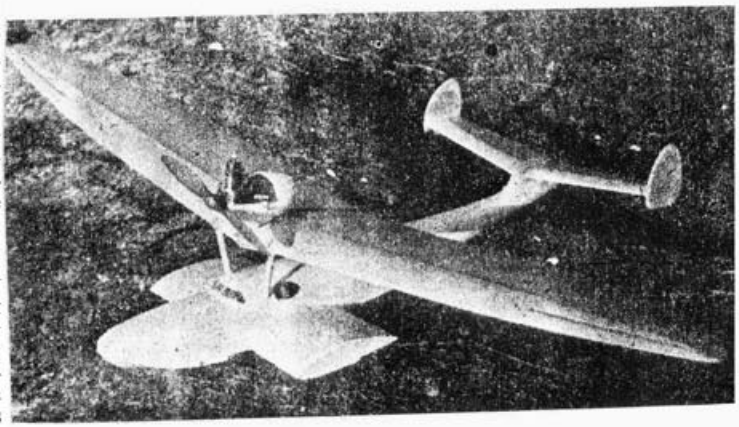
The petrol-driven flying boat is rather a mystery to most petrol fans, for there have been only a limited number of attempts to build and fly this type of petrol model, and certainly a very limited number of successes.

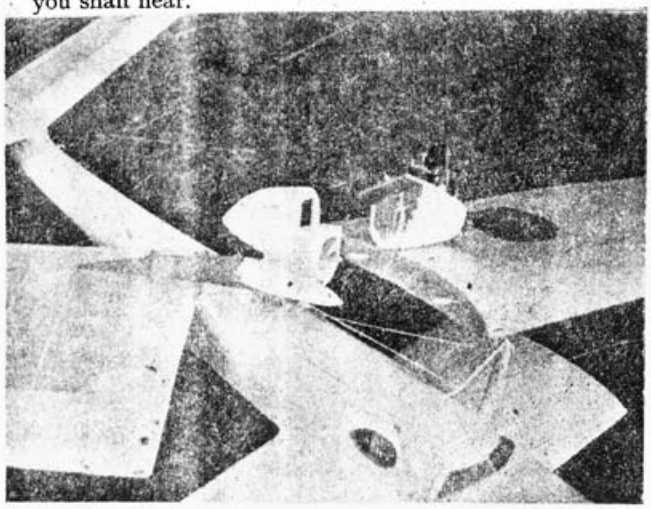
It is a particularly intriguing type of power-driven model because, apart from the fascination of operation from water, there is the dual excitement of producing a stable, airworthy machine and also a seaworthy machine that is stable on the water.

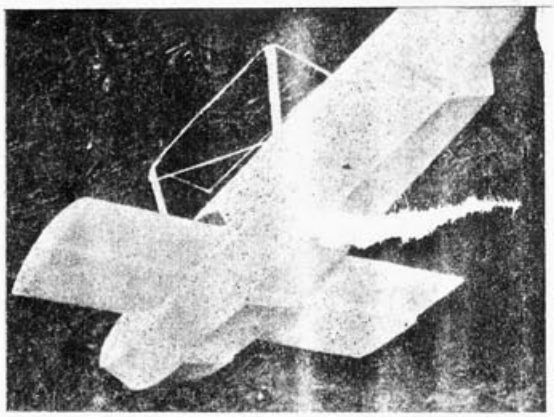
The problem perhaps sounds harder than it actually is, and this may be one of the reasons why so few petrol boats are attempted. There are certain simple rules and facts that make for a satisfactory flying boat, and I propose to discuss these points in this article.

I have noticed that in the majority of the model designs I have seen these fundamental rules have been broken in one or more cases. As a result the boat is not likely to be a satisfactory performer.

So far, I have not seen anything comprehensive laid down in connection with petrol-driven model flying boats. I think my early hideous and extraordinary-looking boat that still holds the British record for this class of model, was the first model boat to take off the water under its own power, and land again the right way up, although I admit in rather a wet condition, as you shall hear.







The photographs shown with this article are of my latest boat which is a development from my previous efforts. I have built it during the war, and as a result it is, of course, untested, except for gliding tests.

Let us examine its main points, because I have incorporated in this design the features that I have found desirable for success. I feel that this boat will be a useful competition machine, as well as a reliable boat to obtain pure fun in flying.

Fig. 2 is a photograph of the boat that shows general features. A balsa planked monocoque and streamlined fuselage is fitted with wide sponsons in lieu of wing-tip floats. These sponsons are provided with steps to assist the take off. They have sufficient surface to keep the model laterally stable on the water. Wing-tip floats are not usually desirable for a single-engined model, for owing to engine torque one float will usually touch and slew the model round out of the wind during the take off. Again, if the model lands with one wing a little low a wing-tip float may cartwheel the model round, and will then cause one wing to go into the water.

On this model the boat hull is watertight, and has no batteries, coil or wiring in it; merely a small breathing hatch that can be opened if any leaks are sprung.

The engine and coil and baby accumulator, weighing 3½ ozs., are all in a detachable power egg. See Fig. 5. This power egg is mounted on a thick 3-ply rib that is sandwiched between the two detachable wing halves. Two dowels pass through the power egg rib. The two wing halves are kept together by rubber bands and keeper wire hooks fixed in the wing halves at leading-edge, trailing-edge and centre spars both top and bottom.

The accumulator and the engine are thus mounted high and out of the way of spray, and yet the weight up high is counter-balanced by the hull low down, due to the parasol arrangement. The parasol wing makes for good stability, quick take off, and good glide, and therefore good, clean landings. It also keeps out of the way of spray and unnecessary weight of water; an important consideration. The wing is elliptical, which gives an efficient wing with a short span and yet plenty of surface. Thus we get our weights near the centre of the boat and so lateral stability on the water is good—and we get a reasonably light wing loading. We also obtain a large central chord and this is efficient for model work. Many people do not realise that a small chord does not give an efficient airflow over a model wing at the slow speeds models fly. A properly designed elliptical wing with suitable section is the answer to the petrol modeller's prayer!

My original wing-tip slots are fitted to ensure that there is no nonsense with regard to stalling. I have touched on this matter in articles in THE AERO MODELLER on the subject of stability, and I have described the construction of these built in wing-tip slots. They are very simple to construct.

The centre-section struts are built into the hull and are a permanent fixture that the detachable wing is located upon by rubber bands to wire hooks.

The centre-section struts are made from wire with balsa fairings bound with silk.

The tailplane is dihedralled and has small twin fins. I have found that this type keeps the model into wind excellently during the all-important take off if the fins look very slightly outwards from each other on the principle of trailing a drogue. The tailplane is kept on to its platform by rubber bands. The fins are well clear of the water.

The fuselage is made long: this looks after longitudinal stability both in the air and on the water. There is plenty of surface below the hull to keep the model from getting its tail unit blown into the water, and becoming waterlogged when sitting on the water. Every model constructed by my fellow aero-modellers that I have seen, has suffered from this defect without exception, although their proud owners snort at the idea of their boats being unstable longitudinally on the water. There must be enough surface sufficiently far aft to stop this distressing habit. If you will look at Fig. 4 you will see what a long stretch of hull bottom there is aft of the main step.

A seaplane or flying boat model always tends to dig its nose in and porpoise during the take off due to the high thrustline. There is no pilot to check this until the boat is well on its main step. I completely overcame this trouble on my first flying boat by fitting an extra step which is situated ahead of the main step at the C.G. of the boat. Thus the model tries to dig in its nose and is at once checked and bounced back by the forward step.

A slightly V step helps smooth landing and prevents a mighty splash. On the other hand a very pronounced V bottom tends to make a quick take off difficult: therefore a happy compromise is necessary—again look at Fig. 4. For main dimensions see Fig. 6.

The boat is painted shiny white which waterproofs it and at the same time makes it look well on the water or in the air. To relieve its whiteness it is called "Blue Goose"! The engine at present is a 9 c.c. Brown.