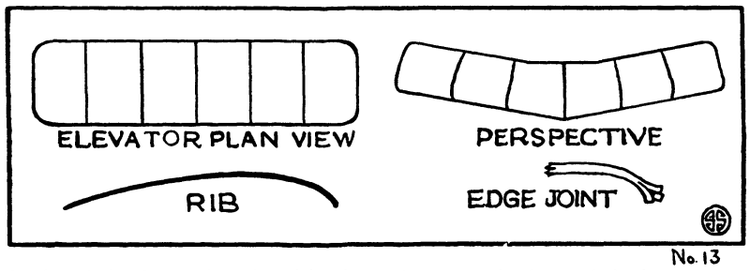
AVIATION

Building and Flying Model Airplanes



No. 13

This is the ninth of a series of articles by Paul Edward Garber, telling how to make model airplanes. Mr. Garber is in charge of aeronautics at the Smithsonian Institution.

Making The Elevator

The elevator frame is constructed entirely of bamboo. This wood should be split to approximate size, and then may be planed to exact dimensions. In the construction of other parts of the model we have used bamboo in short lengths, but for the elevator we will require longer pieces which will require careful handling to produce best results, therefore a few words on bamboo itself will be useful.

This useful wood has the properties of lightness and strength. It is a tropical wood, and is not generally sold at lumber yards but the model constructor will probably be able to obtain some either from a fishing pole, a rug pole, of which your local merchant no doubt has several, from a discarded piece of furniture containing bamboo rungs, or from a porch screen, as these are usually made with bamboo slats. Of course model airplane dealers sell it. It can easily be split, but you must be careful in doing so as it opens up rapidly when once started and you may cut yourself.

The best wood for our purpose is split off not by holding the knife across the diameter of the wood, but rather in the manner one would use to trim the bark from a tree. In this manner wide pieces of even texture can be obtained and these bend easier than those obtained by cutting diametrically. It will be observed that bamboo has humps or nodes every foot or so. These need not interfere in the procuring of a long straight piece, as they can be trimmed flat with a finely set plane.

To make the frame two pieces of bamboo 1/16 inch square and 19 inches long are required. One is used for each edge of the outline. The bamboo can be easily bent to the desired shapes shown in the perspective drawing by holding the part to be curved above a flame and as the part is heated it becomes pliable and can be shaped. Care must be taken not to burn the wood, and not to get the curve too much in one place as this may make a weak spot liable to break. The rear piece is formed with a flat section for three inches in the center, from which the ends are bent upward at a slight angle and curved at the tips, forming a "U" shape 14 inches long. The front edge has no flat section but bends upward from the middle at an angle slightly greater than that in the rear edge. It is similarly rounded at the tips. These two edges are now brought together with a lap joint at the ends, with the edges 3½ inches apart. The lap joints should be about ½ inch long and excess material beyond this point should be trimmed off. The intersection of each of the ends should be slightly recessed to reduce the size of the joint. The ends are fastened with Ambroid and bound with thread.

The ribs are next made. Five are required. To form them take a slat of bamboo ⅜ inch wide, 1/16 inch thick and 3½ inches long. By holding this above a flame until it is hot it can be bent to the shape shown in the drawing. From this the five ribs are split, thus making them identical. If necessary the ribs may be made from 1/16 inch square pieces bent separately but the former method is recommended as being easiest and best.

The ends of the ribs are split slightly and this part forked over the edges as shown in the detail drawing. They are retained in the places indicated in the drawing by the use of Ambroid. The elevator is covered on the upper surface only with a piece of Japanese tissue paper that was left from the wing job. It is covered in a similar manner to that used for the wing, namely, one section at a time is first painted with banana oil and then covered, using a piece of paper larger than

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PSYCHICAL RESEARCH

Ectoplasm Called A Fraud

"Ectoplasm," one of the chief items in the stock-in-trade of present-day spiritism, is something as yet quite unproved scientifically, and all efforts to demonstrate it by really critical methods have ended by demonstrating something quite different: to-wit, fraud on the part of the medium or "psychic" who claimed to have the power of producing it.

Thus declares Dr. E. E. Fournier d'Albe, one of the foremost of living British physicists, writing in the scientific magazine, *Nature*.

Dr. Fournier d'Albe's opinion is not the snap judgment of a person dogmatically prejudiced against such alleged phenomena and unwilling to examine the case before pronouncing his verdict. On the contrary, *Nature* states in an editorial remark, he has given much sympathetic but critical study to the subject of psychic phenomena, insisting only that the evidence pass the tests usually given to any other claims advanced for serious scientific attention.

And he states, at the end of a long investigation of all the available evidence, that there is no proof of the reality of ectoplasm, the hazy, gauzy stuff that is supposed to exude from the bodies of mediums to form spirit materializations. Neither is there any proof, he adds, of the reality of telekinesis, or the ability of certain mediums to raise and move objects at a distance, holding them suspended in mid-air at will.

Concerning the fraudulency of ectoplasm, the British scientist's opinion is emphatic. But the credulity of the believers in this sort of thing makes the fraud easy. Indeed, the habitues of the seances stoutly de-

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MEDICINE

Doctors Increasing

Some 19,662 doctors in the making were enrolled in the 80 accredited medical schools of the country at the end of the last fiscal year, according to a survey just completed by the American Medical Association.

Of these 964 or 4.9 per cent. were women, a slight gain over the proportion of medical femininity of the preceding year. The present figure shows the largest number of medical students since 1911. The ranks of embryo medics have been steadily increasing, declare the editors of the American Medical Association, since 1919 when medical education was completely reorganized and higher requirements established.

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fend the persons who trick them.

"Practically all the well-known mediums have been detected in fraud at one time or other," he says. "But for every such exposure there is a ready excuse. The medium is in a state of trance or semi-consciousness, and the controlling spirits are of all kinds, even tricksters. . . . The supernatural element is introduced at every stage. Even when not deliberately mentioned, it is made to influence the investigator in the form of a demand for 'sympathetic' conditions."

Ectoplasm seems to be different stuff at different times. "On two occasions Dr. von Schrenck-Notzing was able to obtain samples of the substance, and subject it to analysis. The first sample was indistinguishable from human skin such as might be peeled off a human heel. The second sample closely resembled saliva in its microscopical character."

"Quite recently another case of materialization was investigated by E. J. Dingwall. He found the materializations resembling animal tissue. 'The appearance,' he says, 'suggests something analogous to lung tissue, and the smell of the substance, according to Dr. Worcester, resembled the smell of the entrails of a freshly killed animal.' "

Dr. Fournier d'Albe is of the opinion that in view of the often-exposed frauds, a further pursuit of the subject would be unprofitable. "It is impossible to admit the existence of any new facts," he concludes, "and even a tentative explanation of them is uncalled-for. Science might just as well concern itself with the anatomy and physiology of fairies."

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Doctors Increasing

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Records of 63 of the medical schools showed that only 36 per cent. of the costs were paid by students' fees. The remainder came from state appropriations and private endowments. Actual cost of the training of each individual student ran up to $705 for the year, the statistics show, whereas $245 was the average sum paid by each student. The rapidly increasing cost of training new physicians is one of the pressing problems of medicine, authorities in the field believe. One of its most important aspects, in the light of the large numbers of applicants flocking into the schools, is some provision for the properly qualified student regardless of whether he is rich or poor.

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Building Model Airplanes

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the frame which, when all sections are covered, is trimmed off about 1/16 inch from the frame and the protruding edge turned over and fastened with banana oil. As with the wing pull the paper especially taut lengthwise to accurately preserve the wing curve.

Assembling and Flying

To put the various parts of the model together, take the frame and make sure that the propellers are so placed that when the point is directed away from you the right hand propeller will have to turn to the right to push the wind back to you, and the left propeller must rotate left to push. The large wing is fastened between the openings of the rear X-brace with two thin long rubber bands, which are placed under each stick and the two loops opened above the stick, and the wing passed under these loops, which when carefully released onto the wing surface will hold it in place. The elevator is fastened in a similar manner about three inches from the point. Both of these surfaces should be placed with the point of highest curvature toward the nose of the model. The wings must now be lined up to be at right angles to the center line of the frame, and not twisted in regard to each other. It is assumed that the rubber motors were placed on the frame when the power plant was described in a previous article, therefore all is now together. It will be noticed that because of the formation of the elevator the front edge is higher than the rear edge, thus no elevating blocks are needed.

To balance the model glide it several times before launching it under power. Thrust it from you gently while holding it by the propellers on a line with your eyes and if it climbs or dives move the elevator back or front respectively to correct that tendency. In cases of extreme need for adjustment the wing may be similarly moved. When all is in perfect balance the model is ready for flight.

A large field, with no obstructions, is required. It should be at least half a mile square and beyond it should be clear country so that the model will have plenty of chance to go as far as it can without interruption. For the first flights a rather calm day is preferred. Allow an assistant to hold the propellers while you go to the nose of the model and attach the "S" hooks to your geared winder. Stretch the rubbers at least twice their length and wind the rubbers about 200 turns of the winder, in the direction necessary to impart correct rotation to the propellers. As you wind the rubbers come in toward the nose so that when you finish you will be right at the nose hook and can attach the "S" hooks there. Now take the propellers one in each hand, sight along the model for a final assurance that all is correct for flight, stoop down and face the wind. Careful handling is very necessary throughout this stage of the preparations as the frame is under great strain from the rubber motors' pull and any unusual twisting may cause it to break. Therefore from this crouching position carefully rise and as you do so launch the model. Do not thrust it much, just give it a gentle placing on the air. The model should climb rapidly against the wind, then turn and fly with the wind. If it climbs or dives, correct it as for the glides. If it turns to one side move the wing slightly to one side and test again. When perfect flights are obtained carefully mark the position of the surfaces in order that the model may always be placed in the best condition.

It is hard to predict the flight possible with this model, but it can safely be said that if the model has been carefully constructed in accordance with this series of articles it should fly at least for a distance of 2,000 feet and a duration of a minute and half. It is well within possibility that those figures may be doubled or even tripled, depending on the workmanship and lightness of the model.

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Certain kinds of blue cloth stamped "holy" are worn by wandering Moors of Africa, who believe it makes them immune to disease.