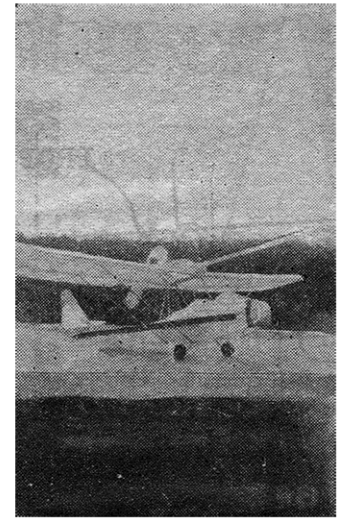
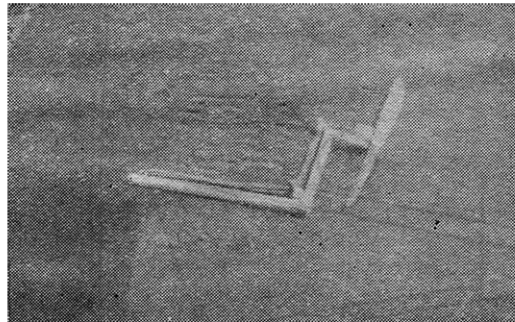


How to Build the Curtiss-Wright "Junior"

By Prof. T. N. de Bobrovsky



THIS is an unusual type of airplane for America, although it was a popular and much used type in Europe. The famous Pischoff *Autoplane* was really the first of this category, designed with the propeller working behind a monoplane wing, with pilot seat under the wing, while the tail group is held by either covered or free outriggers, which can also be classed as a "fuselage."

In 1910 the Pischoff monoplane performed well and was accepted as the official type by the Austro-Hungarian Army. The flying model of this plane was excellent and was considered one of the best models for using gear transmission for the propeller.

The first all metal airplane in the world, the French Ponche-Primard, which was exhibited in 1911 in the Paris Aero-Salon was also of this type. In Germany before the war, Dornier (not Dornier) also designed a few airplanes of this type. During the past years the German firm "Albatros," built and manufactured sport airplanes with the same lines and characteristics as the Curtiss-Wright *Junior* of today.

While in Holland the Koolhoven F. K. 30 sport airplane is also from the same category. The advantages of this type of airplane are the stability, free view of the pilot, pusher propeller and other minor points equally im-

portant. The flying model of these is a great deal better than the ordinary tractor model.

The Curtiss-Wright *Junior* also gave the same good performance and the model shown in the pictures made a take-off with just sixty propeller revolutions. This model is very simple to build and can be completed in a very short time. The first model was finished and ready in eight hours, half of which time was taken up in drying. The drawings were made from some published photos and all data available.

Modifications were made in the rear fuselage line to make it stronger, the distance between the fuselage and wing was increased, owing to the diameter of the propeller, and a few other points were changed to make it less difficult for you to build.

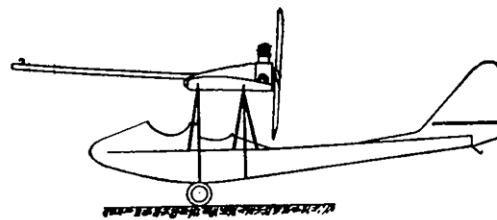
IMPROVED the most simple method for the motive power. Perhaps the motor stick at the top of the wing detracts from the appearance of the model, but it is simple and more effective.

It is also possible to build this model with a compressed air motor by using the fuselage for holding the tank, and a longer tube to the motor.

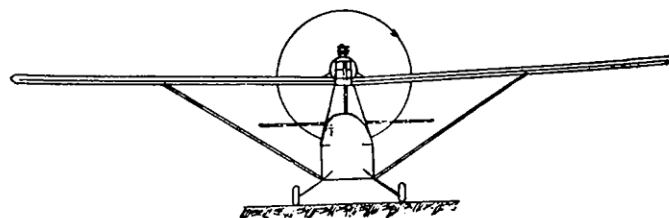
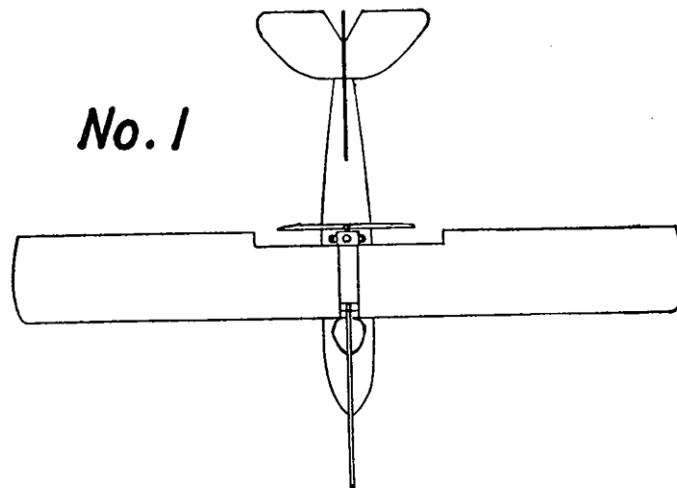
Another way is by fixing the rubber motor in the wing between the spars, using two gears for transmitting the power to the propeller.

Still another method is
(Continued on page 39)

A Scale Flying Model of America's Popular Light Plane



No. 1



THE CURTISS-WRIGHT "JUNIOR"

(Continued from page 29)

to use a rubber motor in the fuselage, with rubber or thread transmission to the propeller. I have already written about this in a previous issue of MODEL AIRPLANE NEWS.

I constructed an entirely new device especially for the *Junior*, which is shown in the picture, but as this is rather complicated for an inexperienced model builder I abandoned it, although this method made a better looking model. In answer to the curiosity of our readers, this device is also a motorstick with rubber motor. The motorstick, however, is made of three pieces, arranged so that one piece is above the wing and is covered with the "tank"; second piece through the wing entering the fuselage vertically, and the third is in the fuselage.

By looking at the picture it can be seen that the rubber is parallel with the stick, having three lines and two corners. In these corners I have used revolving rings, which means that the rubber bands pass through these celluloid rings. The rings are placed in a wooden box to permit free revolution.

If you wind up the rubber, the revolving rubber will revolve the ring at the same time. This method permits the rubber motor, despite the fact that it is in a double broken line, to be wound up completely and released. It would be very interesting for you to try this device.

Now for the model with the regular motorstick. In the first drawing we have three views, showing the most important details for you to know before you start building. Drawings 2 and 3 show side views of the fuselage also how to assemble the cabane, motor, wing, landing gear and rudder. Drawing 4 is a top view of the fuselage. Drawings 3 and 5 show the bulkheads and cockpit formers I to IX.

The fuselage was built with four 1/16" sq. longerons. We call your attention to the fact that after the bulkhead No. VII, the top longerons are bent slightly upwards. The noseblock I is made of soft balsa (25/32" thick). The other bulkheads are of 1/16" sheet balsa. No cross-bracings are used. The cockpits are formed of 1/64" sheet balsa, as shown in drawings 2 and 4.

When your fuselage skeleton is ready, cover with superfine tissue and give one coat of light natural dope.

Drawing 7 shows you next job, the landing gear. Make this of wire (.034). The wheels used are 1" diam. celluloid. To make the landing gear stronger glue pieces of ovaled 1/1" x 1/8" strips behind the wire arms. Now, look at drawing 2 and you will see that the landing gear is ambroided to the bottom of bulkhead No. V. The tailskid is made of wire (.034). See drawing 3.

Next, make the rudder and fin, of 1/16" sq. and 1/16" x 1/8" strips. (See drawing 3.) Nos. 4 and 5 are cut from 1/16" sheet balsa. The rudder must be covered on both sides. Glue to the end of the fuselage as shown in drawing 3. The stabilizer (drawing 5) is made of the same material as the rudder, but use 1/16" square bamboo

for leading edge. Cover both sides of this and glue to the spar of the fin only. The leading edge of the stabilizer can be glued to the leading edge of the fin, as needed during the tests.

Now, cut from 1/16" sheet balsa sixteen ribs (see drawing 2). With these form the wing. The leading edge of this is 1/8" square strip rounded as necessary. For the front spar, use 1/16" x 1/4" strip; for the rear spar 1/8" square and 1/16" x 1/8" strip for trailing edge. This must be tapered in chord. The wing tips are made of 1/16" square bamboo. To make a nice neat job, with bamboo, for the stabilizer and wing, do not bend the bamboo with heat, a better method is to fix the wing to the table, with pins and with pins fix the bamboo direct to the wing in the right shape. Ambroid the whole bamboo piece and allow to dry for fifteen minutes. Then remove the pins. When bent by heat the bamboo loses elasticity and cannot be used to good advantage.

Before you cover the wing with superfine tissue, allow for dihedral, which is 2°25' for this model. The dihedral starts from the center section, but the space between the two center ribs remains intact. It is necessary also (see drawing 7) to cut ends of the four central ribs and glue a 1/18" square false trailing edge (9).

The finished wing must be attached to the fuselage with six pieces of struts. See Figs. 1 and 2. Be careful that the wing has 2° angle of attack. The struts are made of 1/16" x 1/8" strips (1), (2) and (3). The wing is also braced on the outside, with four oval struts "A" and "B". These are made of 1/16" x 1/8" hard strips (see drawing 7) and glued in place. In the fuselage drawing (2) and the wing drawing (6) the capital letters "A" and "B" are used to mark the joining points for these.

The last step is to prepare the motor parts. First, make the motorstick (drawing 6). To this glue the usual kind of hook to the front. At the rear end glue the motor crankcase (7). This is made of 3/4" soft balsa and has 1" diam. Behind this, glue a 3/4" diam. 1/32" thick plywood disk (8), bore a hole through the center of these and glue an eyelet in this hole. The propeller shaft will revolve in this.

If you care to, you can glue three celluloid cylinders to the crankcase, in the form of a reversed Y. The original of the model has a Szekely 3-cyl. motor. Drawing 3 shows the propeller form. Considering that the model has only a small diameter propeller (five times smaller than the wing span), it was necessary to use a special form, which is made of 3/8" soft balsa. The propeller is left handed. The shaft is the usual type. Motive power is eight loops of .045 square rubber. Make two motorstick holders (10) and (11) of 1/16" sheet hard balsa. Glue one to the false trailing edge and the other to the center-ribs (drawing 2).

Be careful that the propeller thrust-line has 4° angle to the fuselage center line. Glue the motorstick to these. Make the "tank" from 1/64" sheet balsa. For this

you will need two sides (6). Glue these to the center ribs and crankcase and cover the top also with balsa sheet, leaving only the necessary opening for the free movements of the rubber motor.

When all this work has been done give the wing, stabilizer, rudder and struts one coat of light dope.

Give the bearing a few drops of oil and wind up the motor. Give it seventy revolutions at first. Place the model on a smooth surface (ground) and release the model. If it stalls, place a small piece of wood between the lower part of stabilizer leading edge and fin. This will give the stabilizer a positive degree of incidence. If in the next attempt the model, with the same revolutions taxis but does not climb, fix the stabilizer at 0°.

If the model is built according to instructions, 0° is needed for the stabilizer. After this, you can wind the motor full. The model will give a good performance in flying and gliding, and will not stall at the end of the flight.