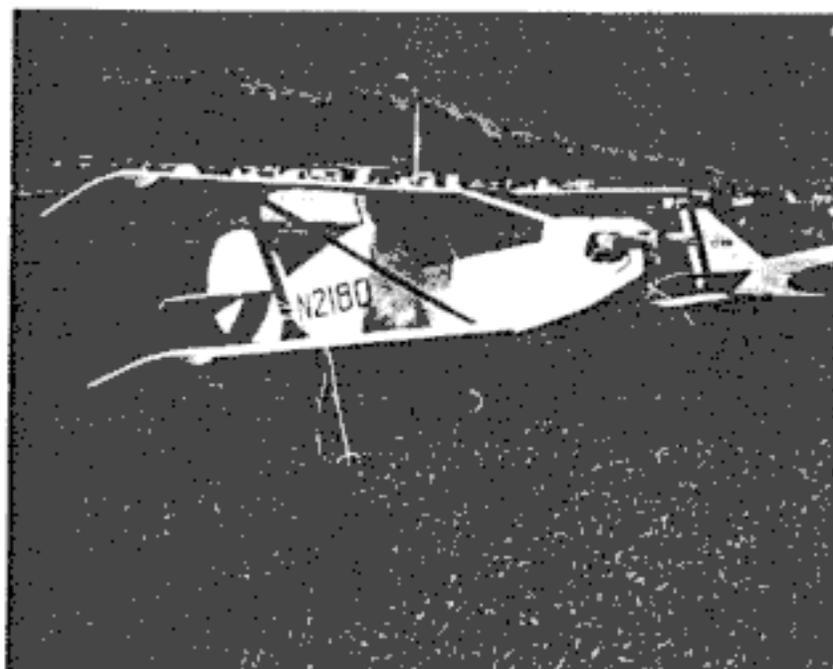
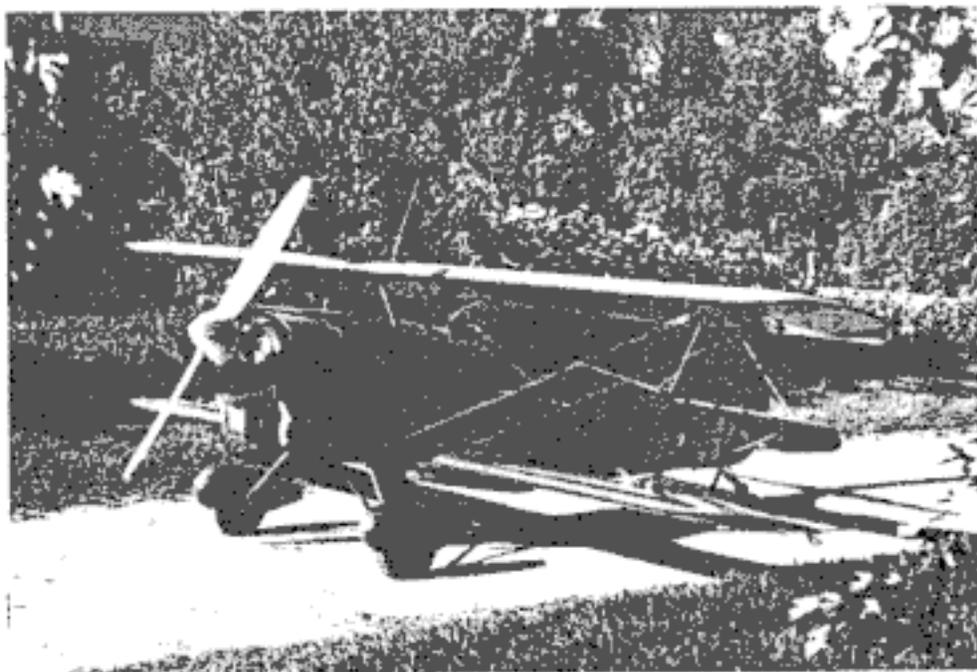




Here are two instances where home carved propellers could be employed to good advantage. The trouble with a purchased propellers on ships like these is that they usually cost so much that the homebuilder, even though he is less than well satisfied with it, he is reluctant to try another because he does not want to spend the money.

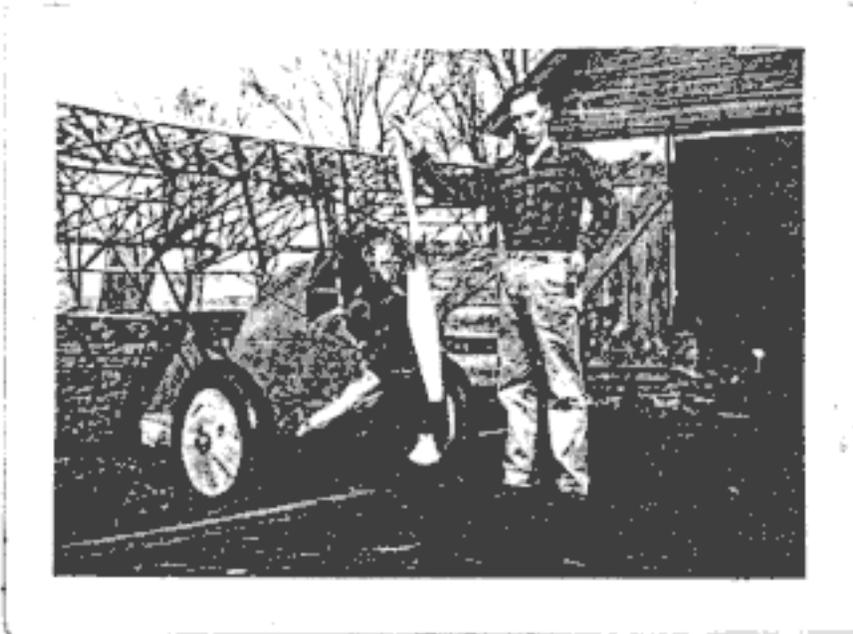




This little plane could have used a wide blade wood propeller. In level attitude it had a ground clearance of only 6 inches!



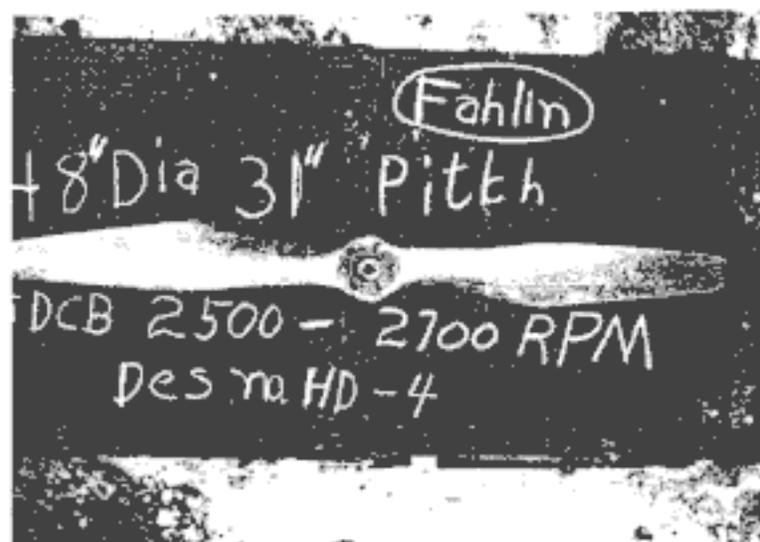
This "Moon Maid" was the first U.S. design VJ powered ship built in this country. It has attended every Rockford and Oshkosh Fly-in since 1964. The present propeller was carved by the builder.



This is a propeller carved by the author about 1940. The man in this picture is not the author, He only aided and abetted him.



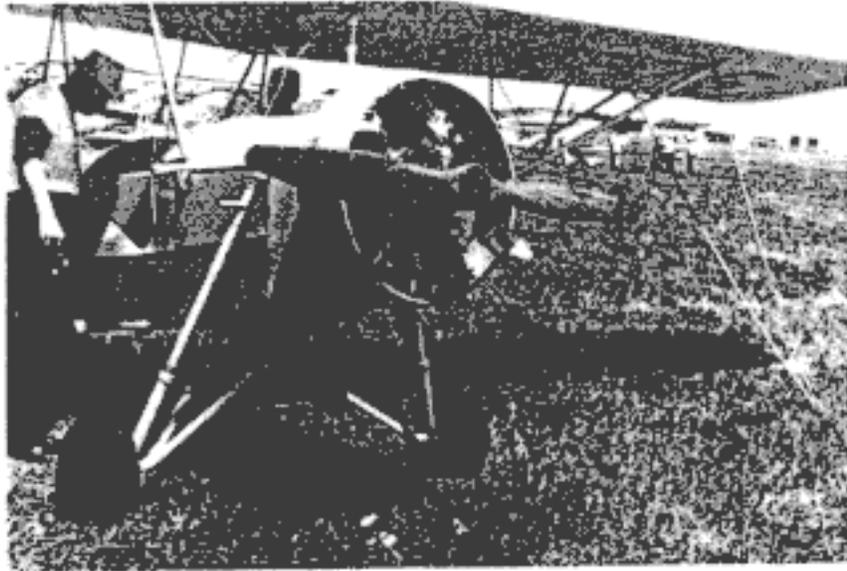
Another view of that same propeller. Note that motor mount. I'll bet you havn't seen many like it.



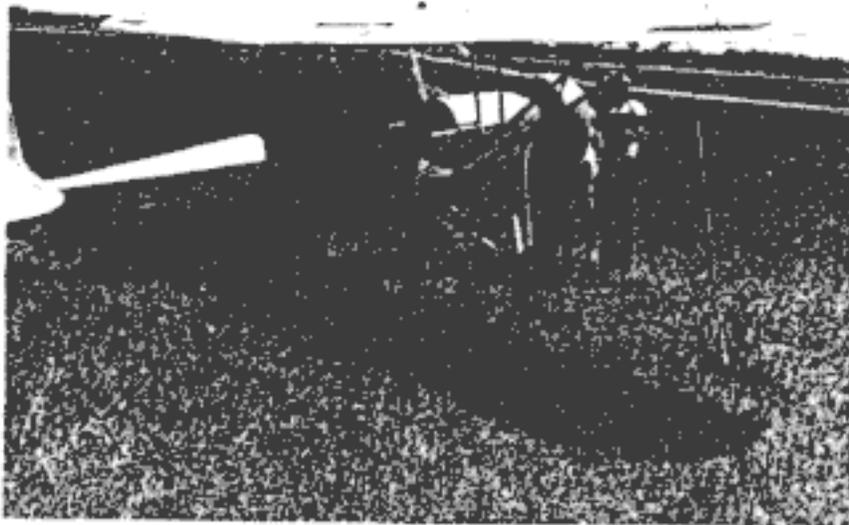
This is the propeller shown in those other pictures. It is of white pine. It was a copy of one seen on an NB Trainer. Does anyone remember that plane? The Harley "74" turned it 3100 static, not the figures shown in the picture.

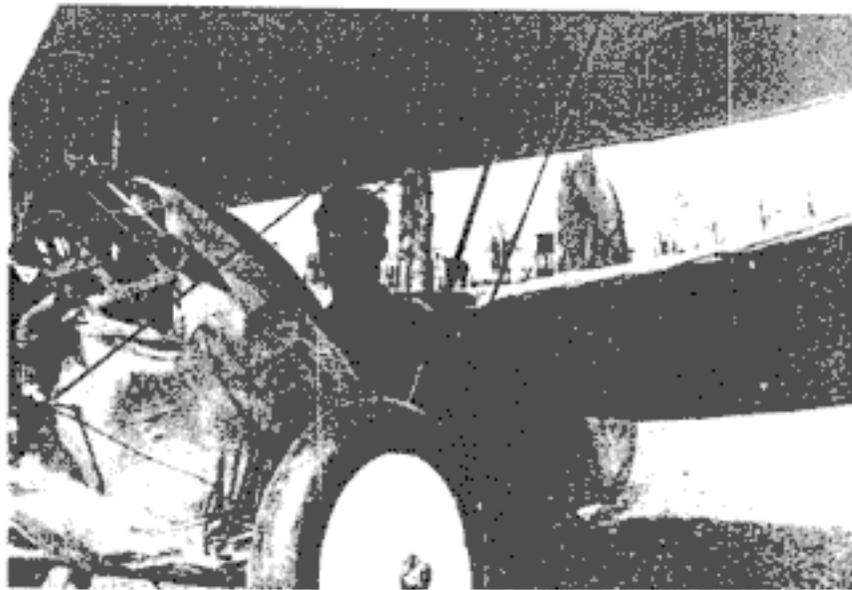


This prop was carved from an oak 2X4 . The prop shown in the other pictures had suddenly become too short. Do not become too excited about that engine---. It has been extinct for many, many years. It had so much vibration that it could have flown without any wings!

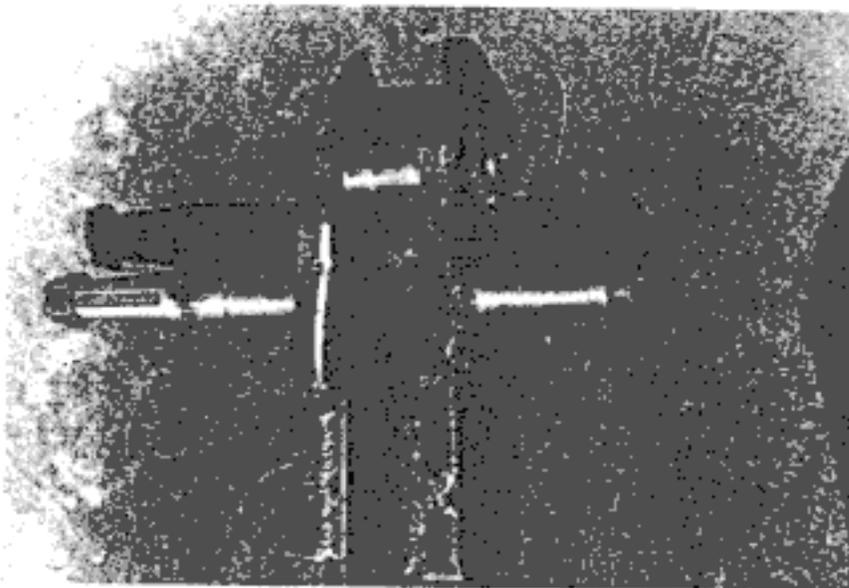


The propeller shown in the pictures of the "Flea" a couple of pages back was patterned after the one on a plane just like this. The designer of the plane was also the designer of the propeller. He designed and produced propellers for other planes also. These pictures were taken about 10 or 12 years ago. The plane that I copied the prop from flew from our farm in 1936 or '37. It was called the K.B.Trainer. The pilot later fought and lost his life in the "Battle of Britain",- the real article,- not the show.

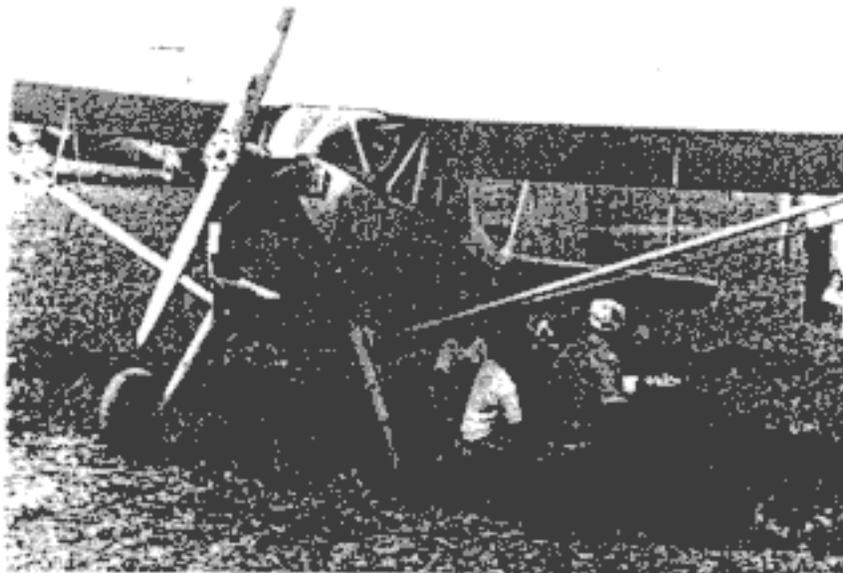




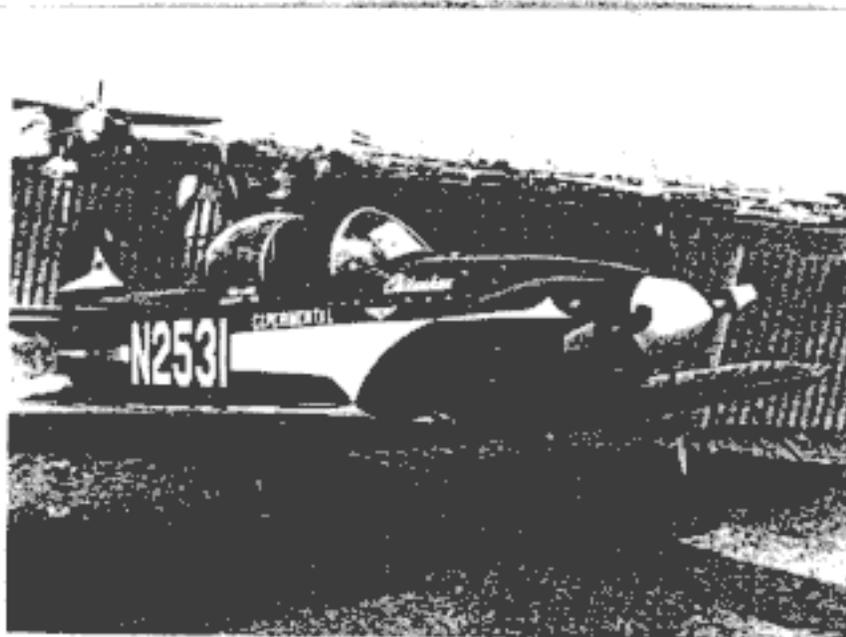
A picture of the author in his "Flying Flea" back in 1941.
He had hair then.



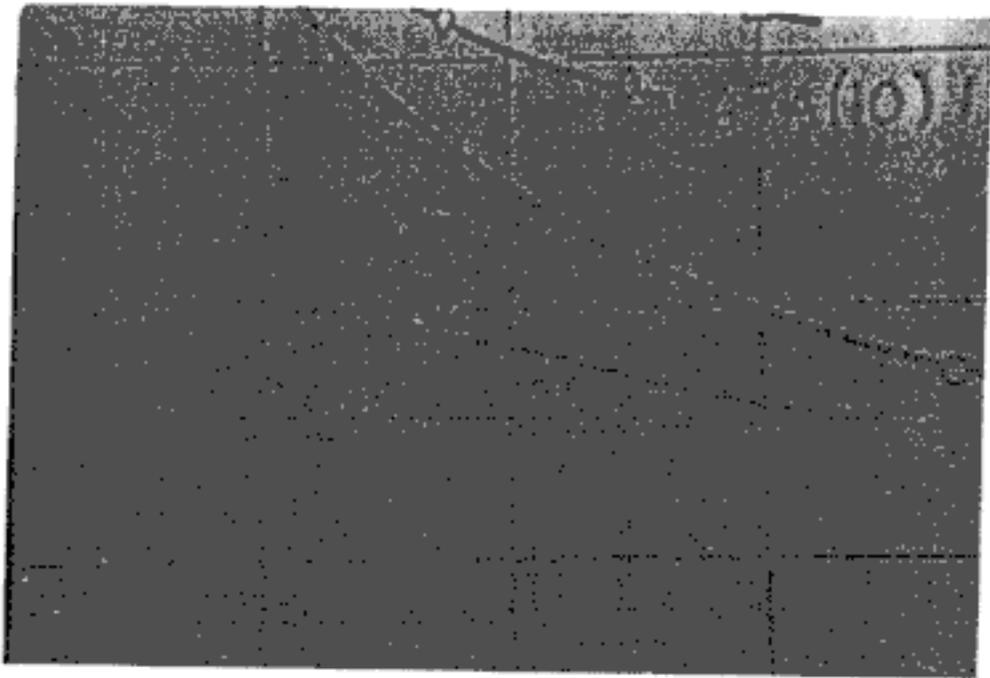
This is a picture of a two piece counterbalanced crankshaft that he built for the engine of that "Flea". It weighed 11 lbs and replaced a flywheel assembly weighing 44lbs. It was made from the crankshaft of a junked Overland car engine.



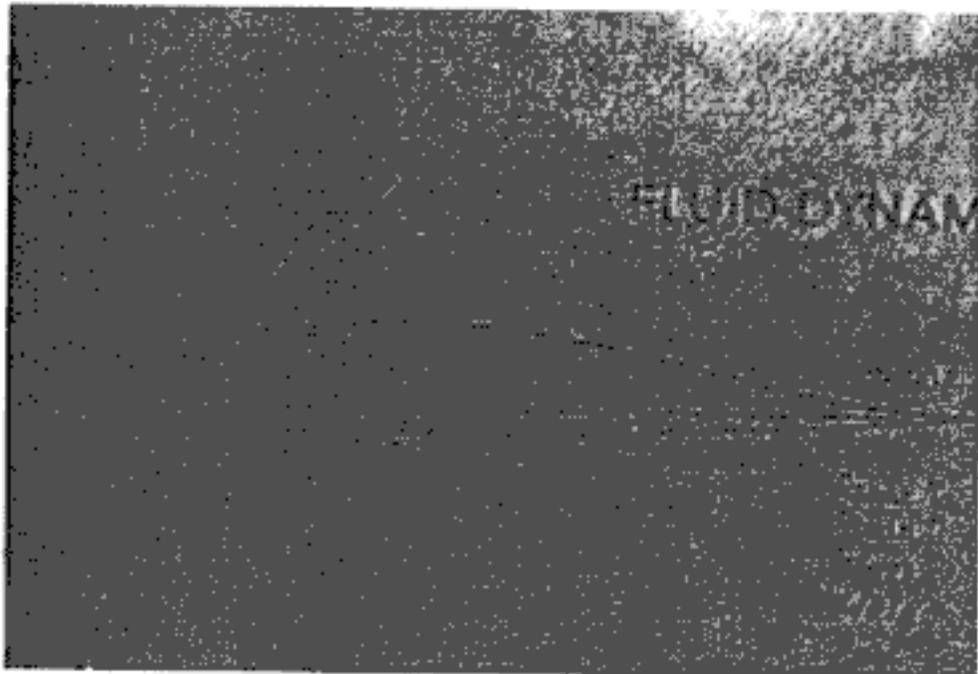
That's an Aeronca "K" in this picture. It was built in 1937. My brother has one of these. He bought it back then. He has had it ever since. It still has all the original parts. The engine has only 36 HP. Notice the long narrow propeller blades. It is supposed to be a 69 X 33. The plane is a two placer if the people are not too large and the weather is cool.

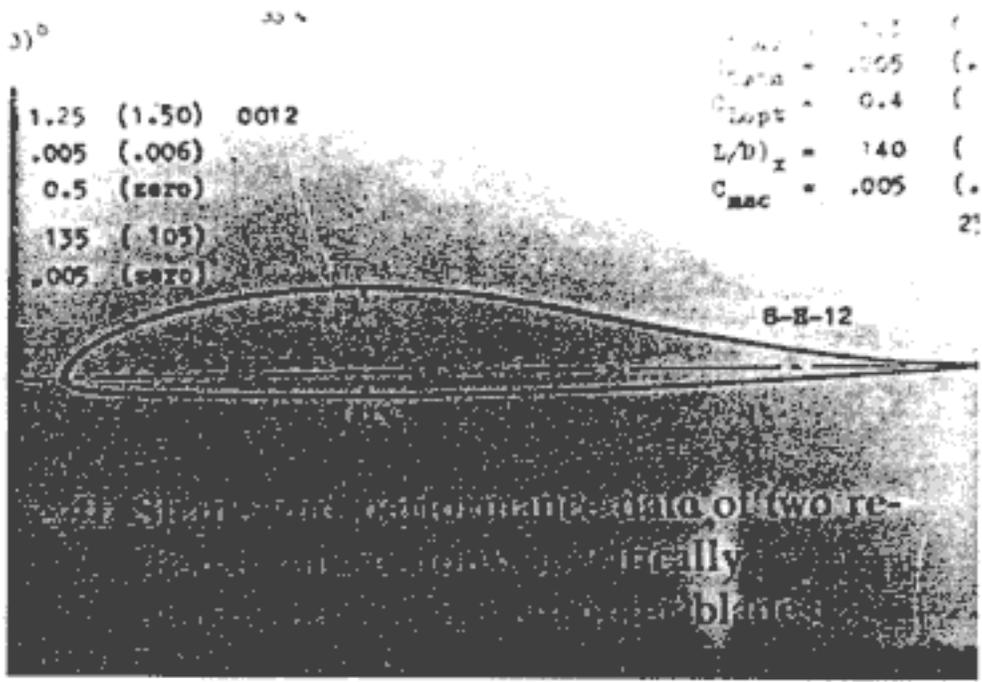


When I first saw Bob Ladd's Taylor Mono with its four blade propeller I never thought it would fly with that. Later when I saw it takeoff and climb up I had to change my mind.

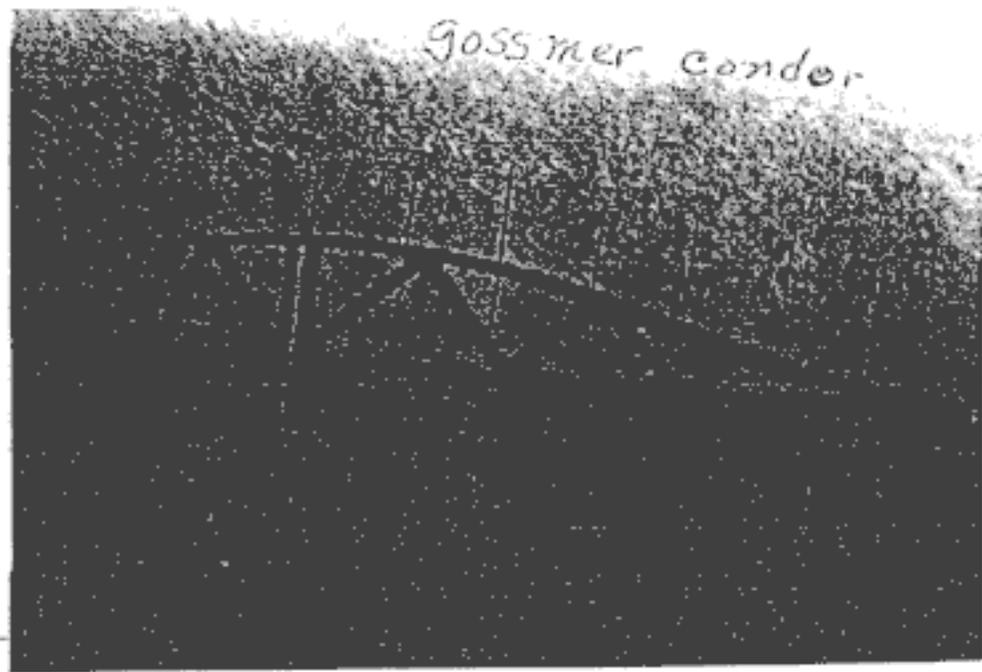


Here are a couple of laminar flow airfoils designed for helicopter blades and which might also be suitable for other applications also, but hardly for aircraft propellers. The trailing edges of the sections are too thin. Laminar flow airfoils are extremely sensitive to bugs and other rubbish on the leading edges. Some can be very adversely affected by rain.

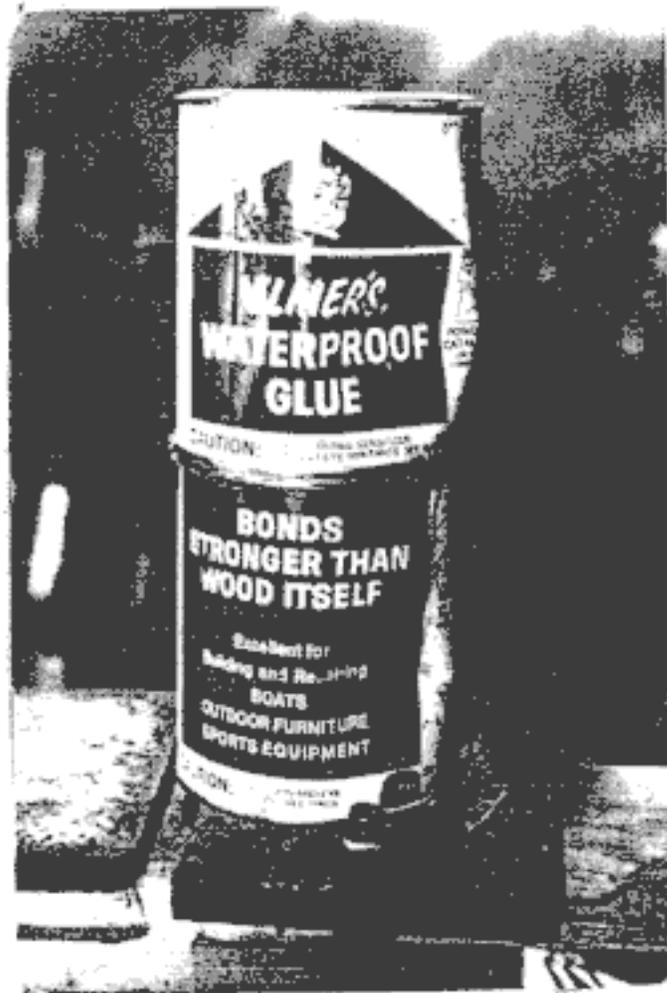




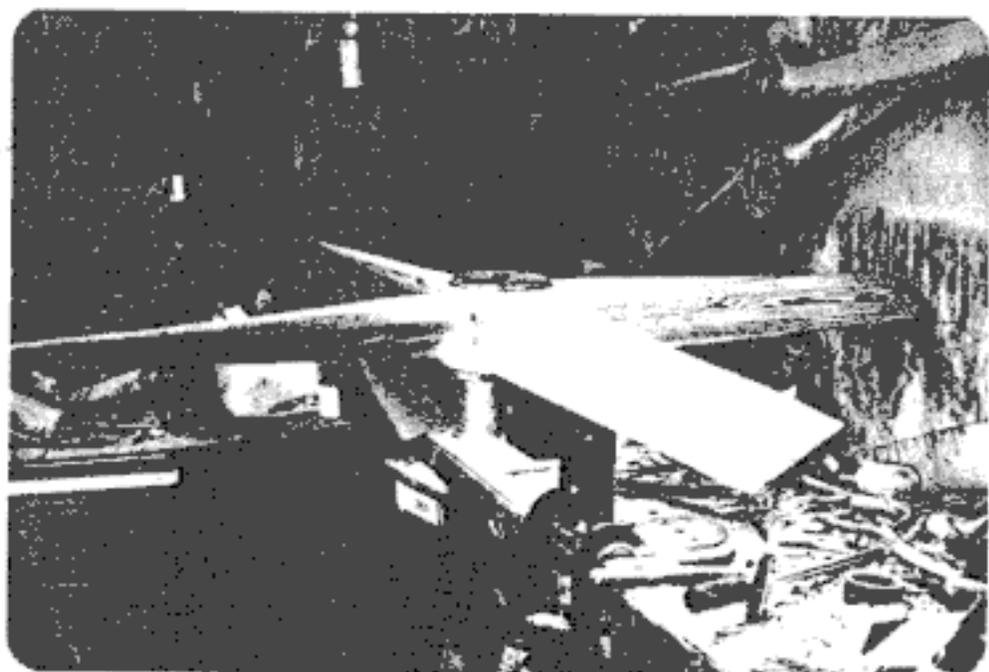
This is a reflexed laminar flow airfoil developed for use as helicopter rotor blades. Helicopter blades must have a constant center of pressure, (be stable). This is achieved through the use of the reflex at the trailing edge. Propeller blades generally do not have this requirement.



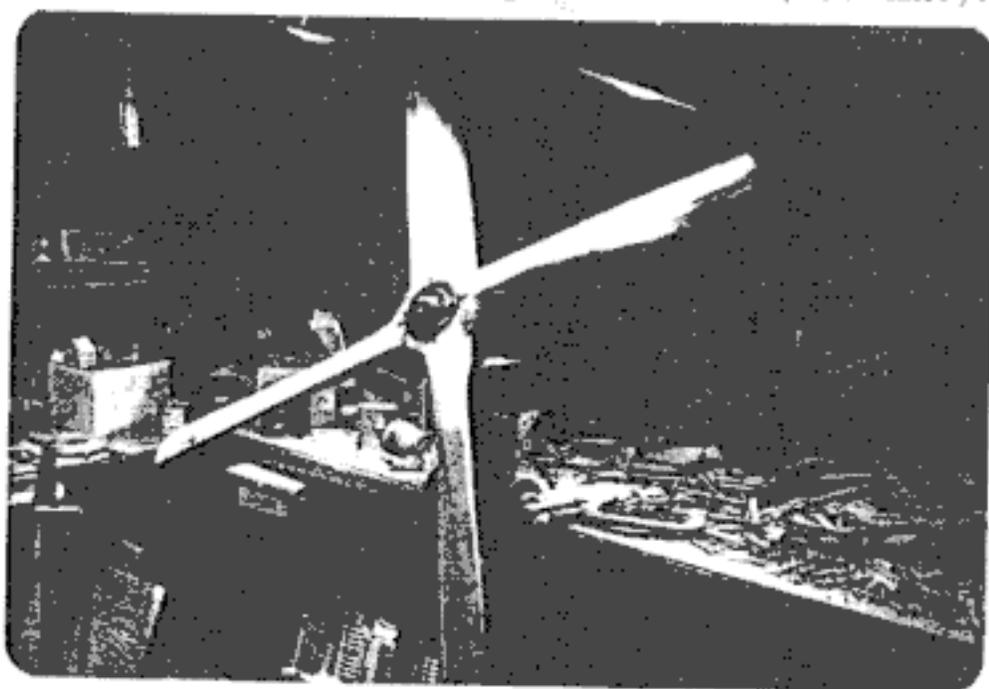
This was the airfoil used on the Gossmer Condor. Not just an awful lot different, only a lot blunter on the leading edge.



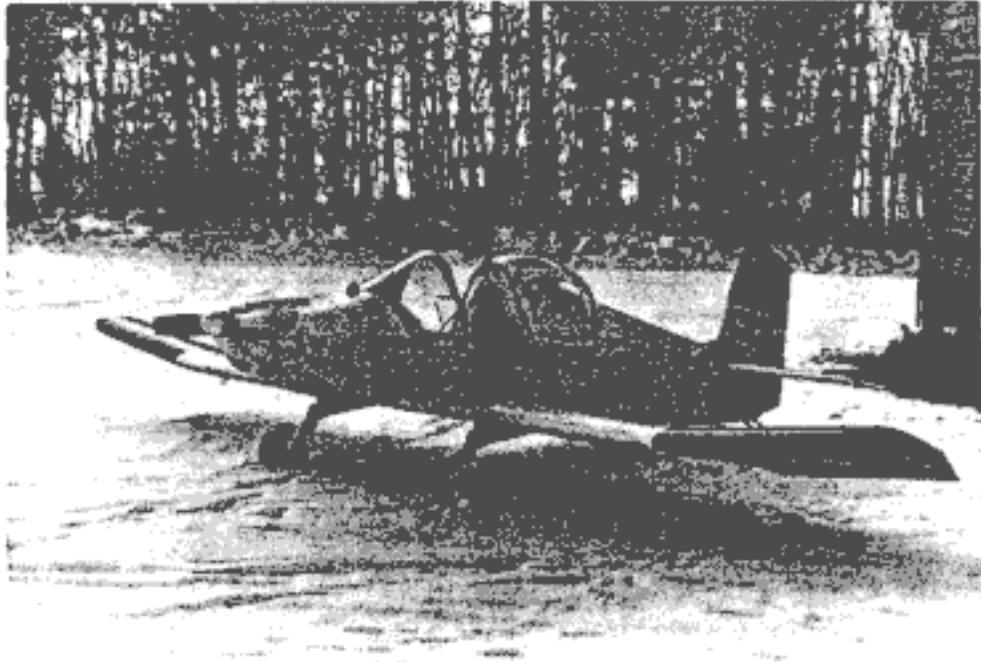
This is a resorcinol glue. It consists of a reddish powder which is mixed with a kind of a varnish in certain exact proportion. It comes in a two part can. I have used it on most of the propellers that I have made.



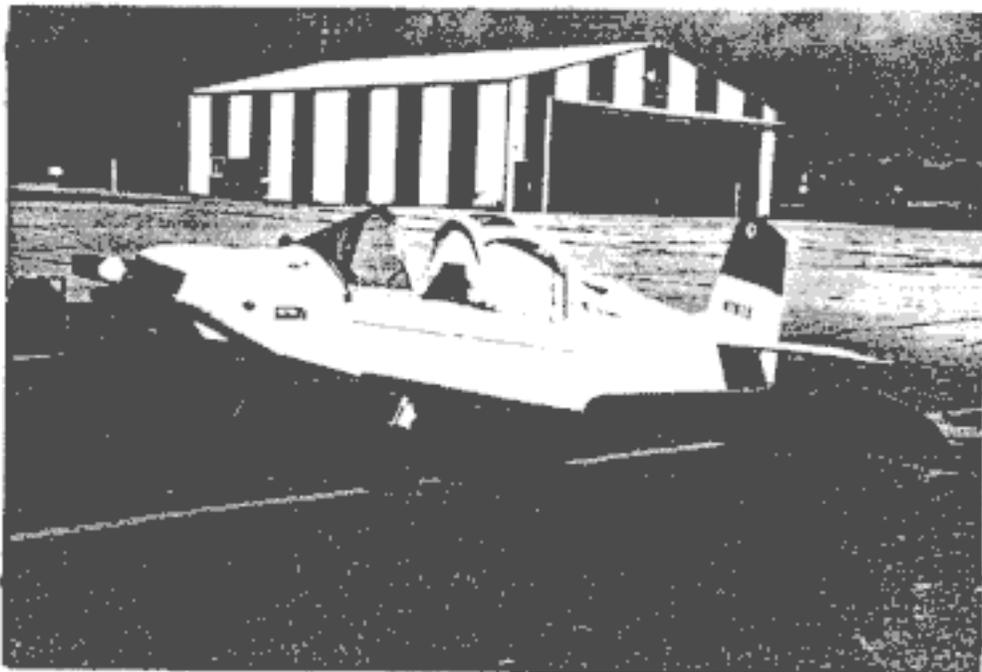
This four blader is made of fir. It was carved almost completely using my 4" 10,000 rpm disc sander. The wood was too ornery to use a drawknife or a spokeshave. A rasp was about the only other tool that would work. The prop is for a Corvair powered KR-2. (not mine).



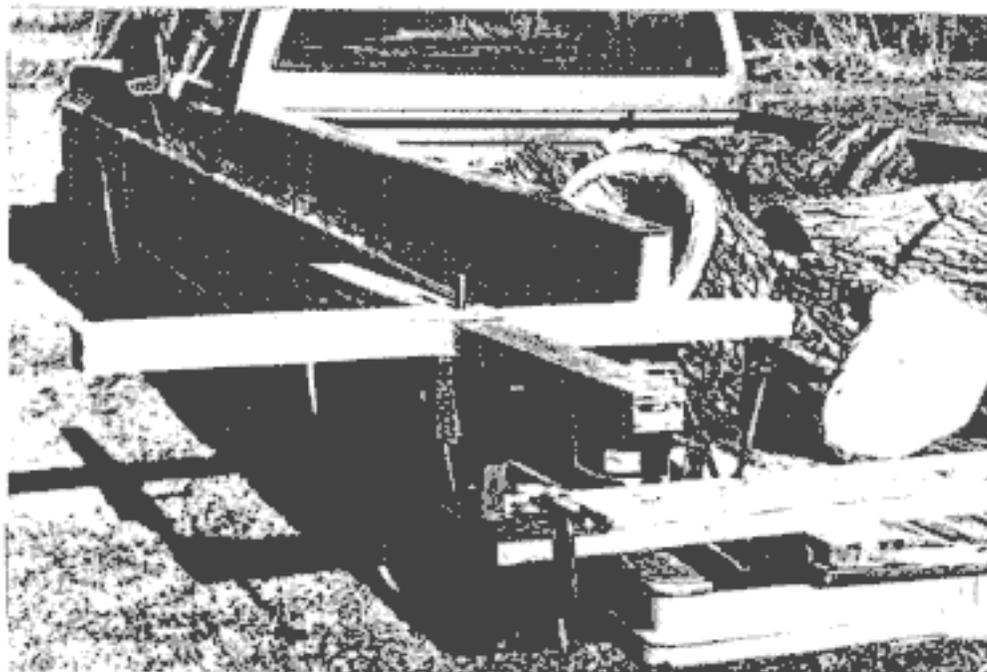
Notice my "home grown" prop carving stand in many of these pictures. I am a bit proud of it. With it I can hold a prop in almost any position which might be convenient for the job being done. It clamps to a bench or to a plank.



Yes,—it has been flown in the winter. Both on Christmas Day, and on New Years Day. Also one day when the temperature at 3,000 ft. msl was -5 degrees F ! That canopy is what makes that possible.

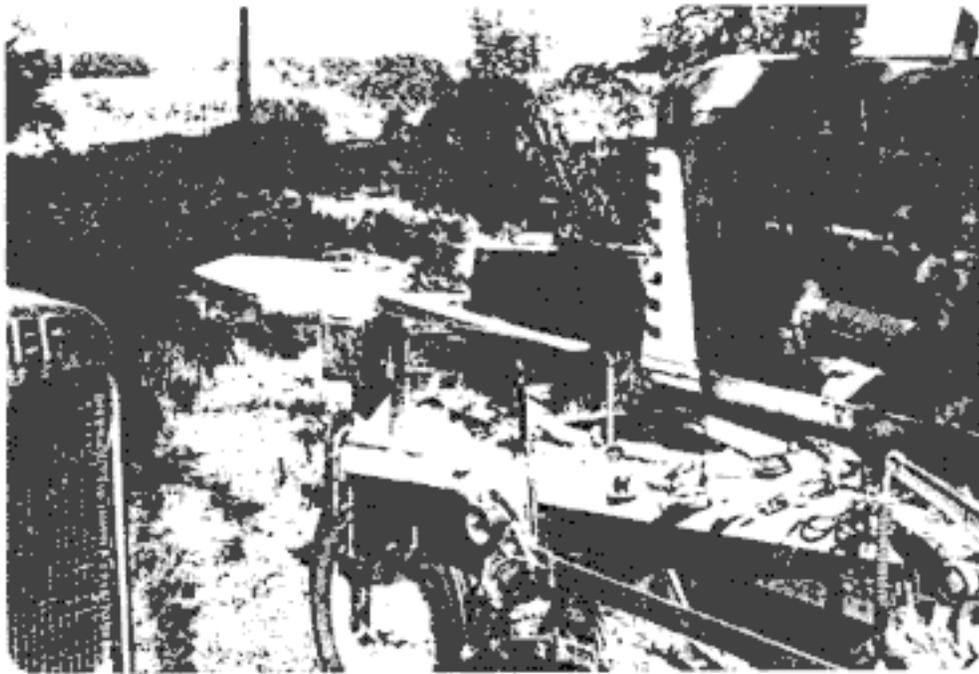


This shot taken at Decorah, Iowa.

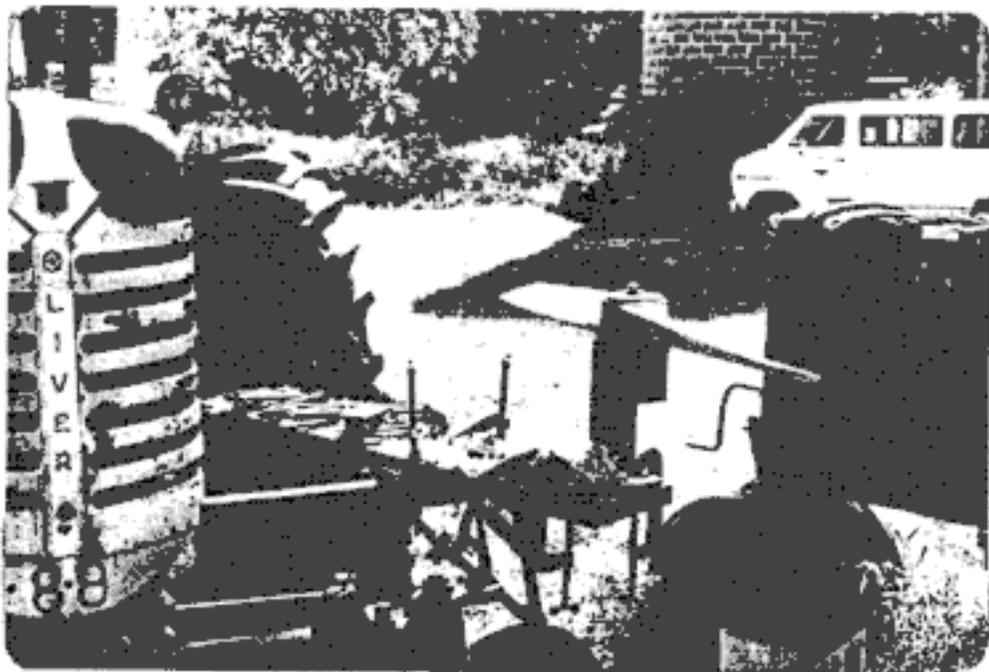


A couple of pictures of that carving fixture clamped to the back bumper of my pickup.

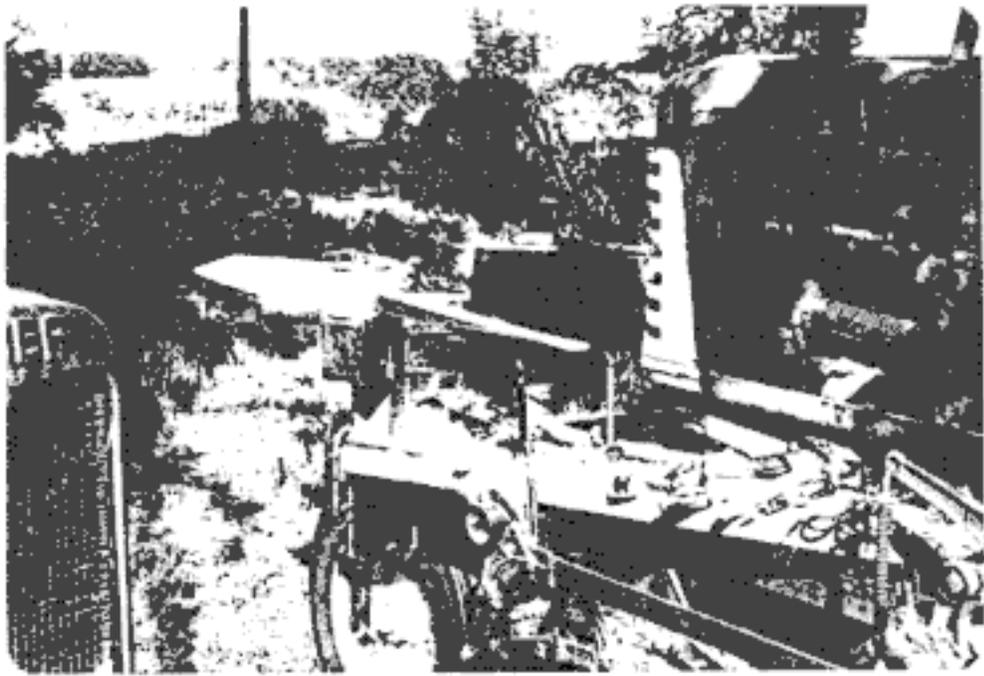




You have heard of shade tree mechanics? Well-, here is a shade tree propeller carver! That is my "Butter Paddle Special" being hacked out in these two pictures.



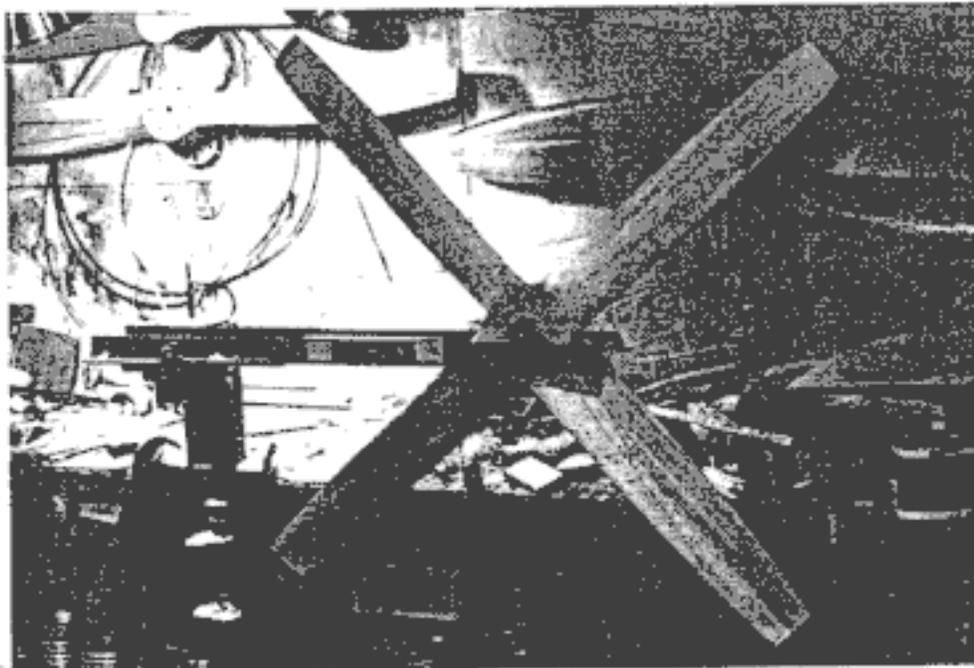
My propeller carving fixture is clamped to the cultivator on my trusty Oliver "88" tractor. Time-? Middle of July 1980. I consider this "Butter Paddle Special" to be next to the best propeller I have yet used on "Die Fledermaus".



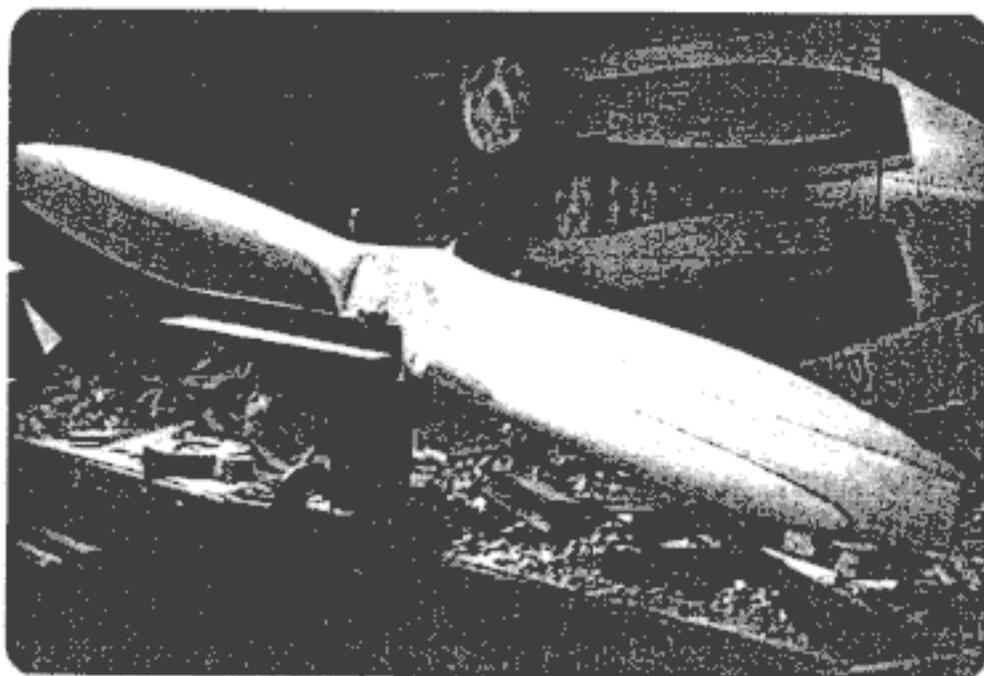
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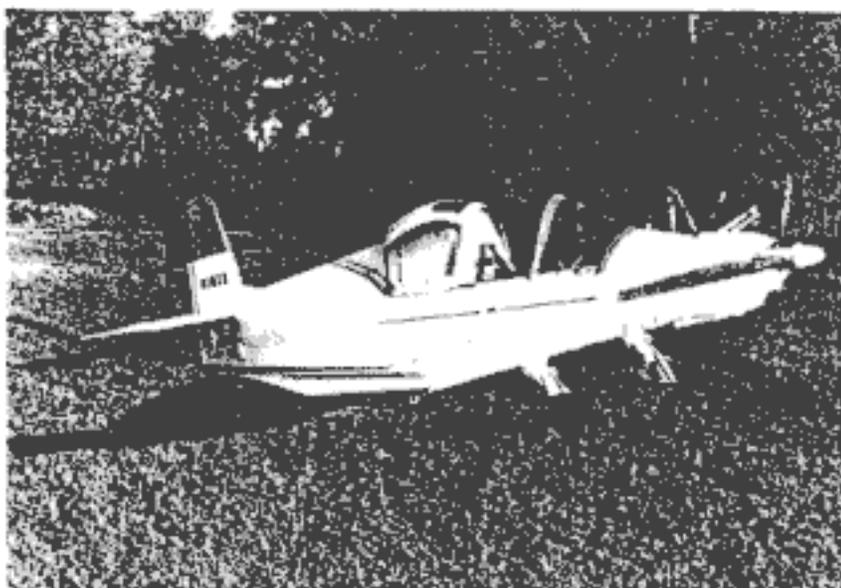
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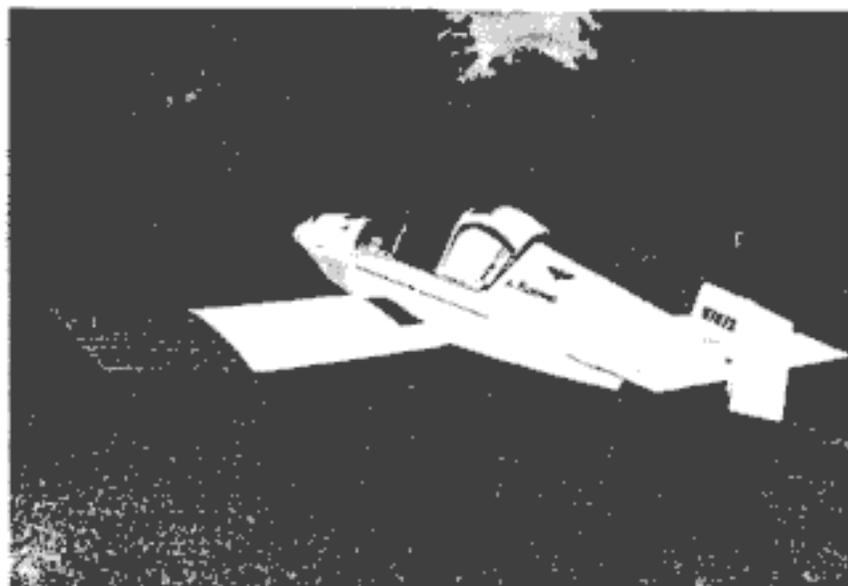
A couple of pictures showing two propellers being balanced. While these reprints do not show things in such good detail as the original print did, one can see the horizontal ways and rod through the hub which permits the propeller to roll toward the heavier blade. This outfit is very sensitive, showing the effect of a single stroke with a varnish brush on one of the blades. The propeller above is my first four blader.

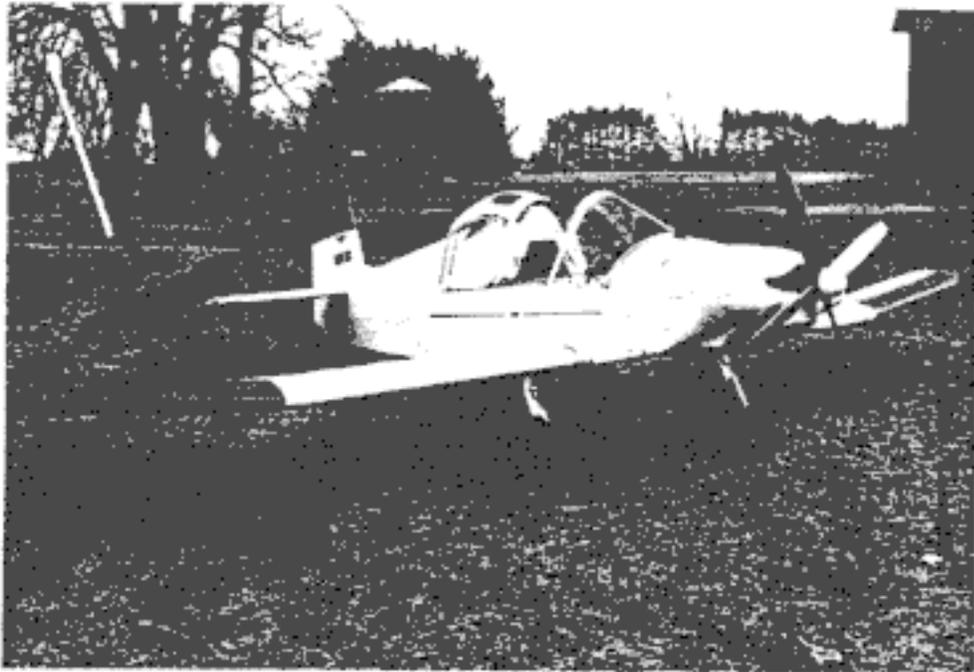


This is propeller FKS-1 being balanced here. Note the glue lines on the blades. They are an aid toward getting one blade just like the other.

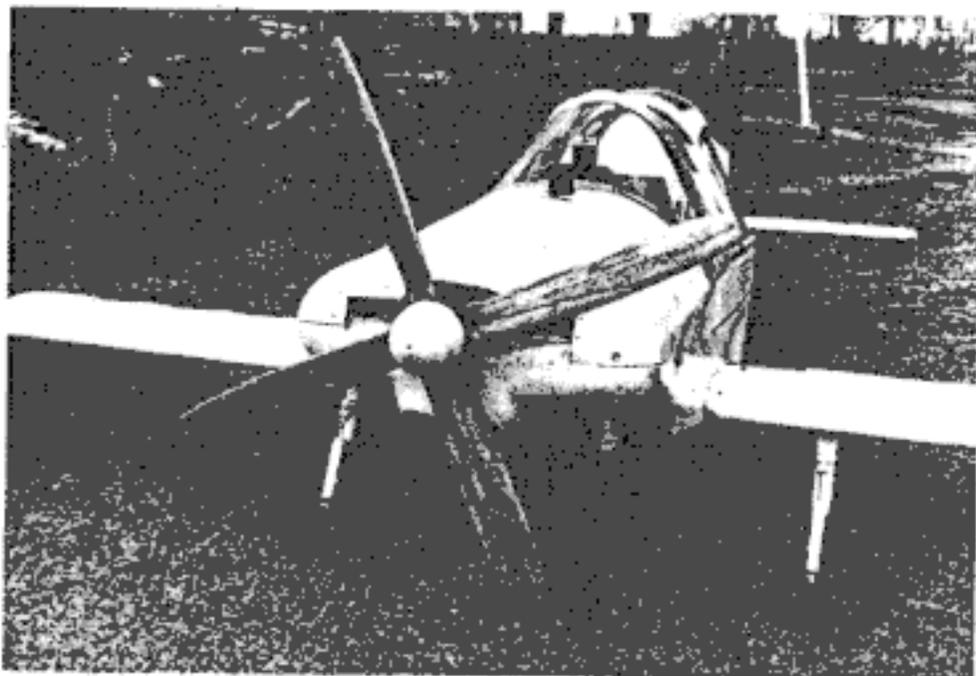


A couple more pictures of "Die Fledermaus".



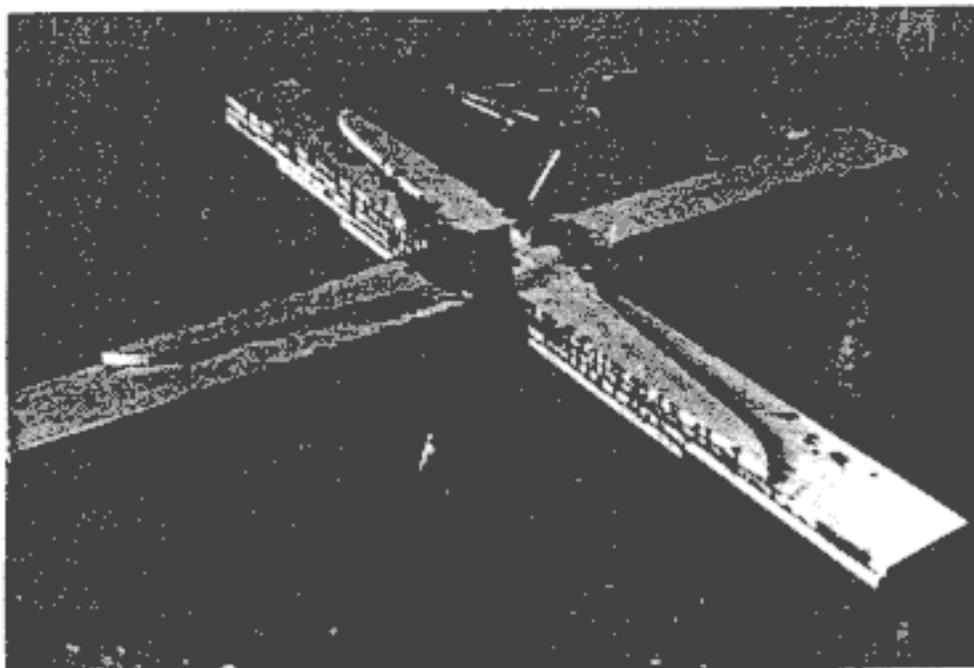


Here are a couple of pictures of the second four blade propeller flown on "Die Fledermaus". It is 45 inches in diameter and has 37 inches pitch. Its blades are rather narrow. Its pitch on the inner two thirds of the blades had to be reduced from its original specification. I am of the opinion that to really give good performance a propeller must be "tailored" to the ship on which it is to be used. This is, at best, difficult for a prop maker 1,000 miles away to do for you.

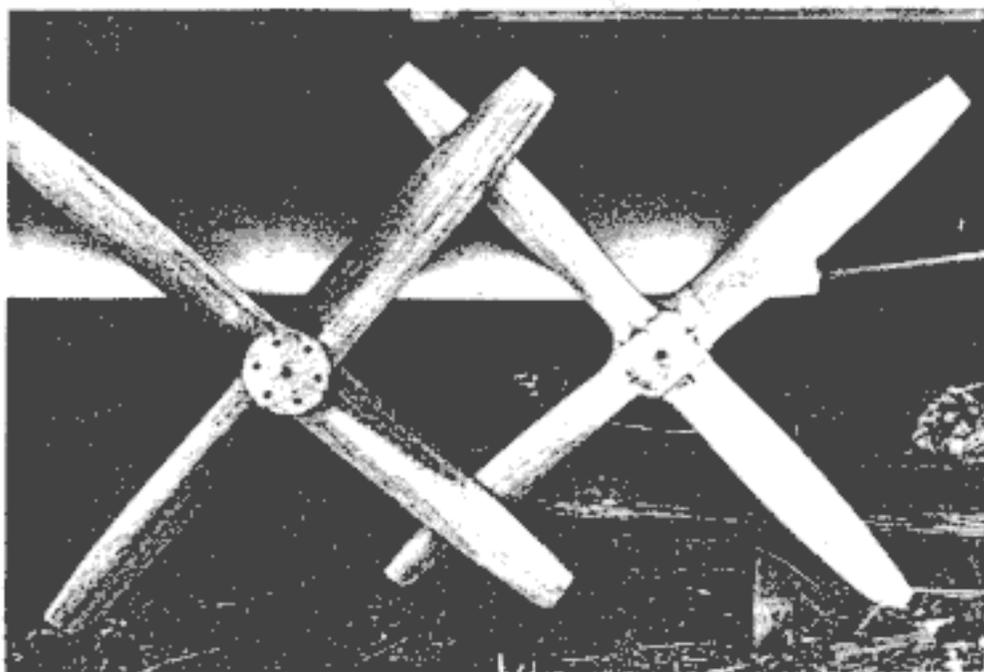




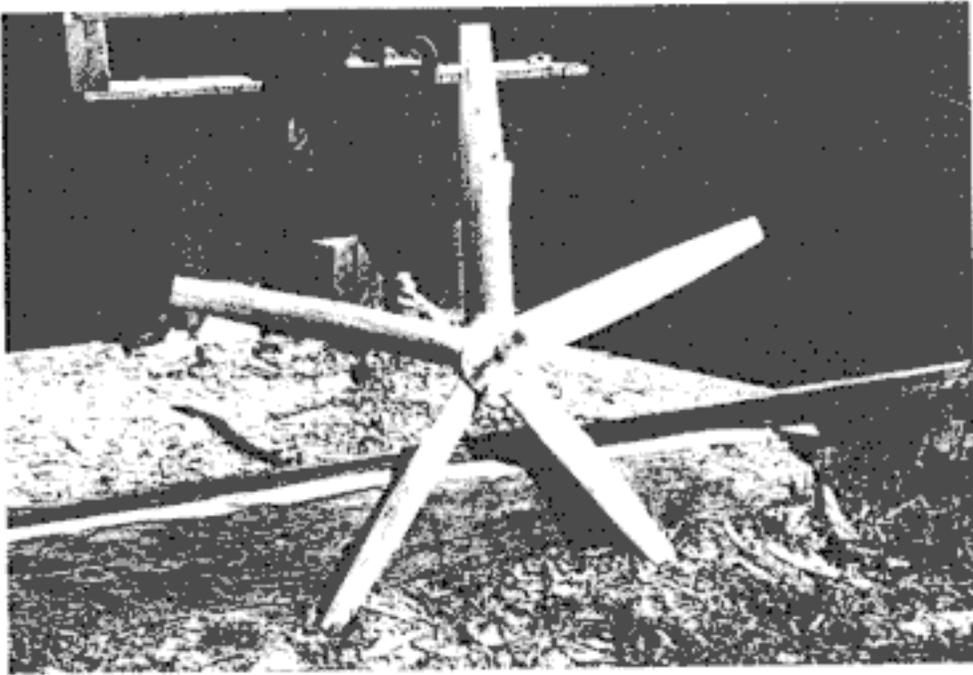
August 8, 1981: "Die Fledermaus" in campground just south of Ollie's Woods, Oshkosh, Wisconsin, all packed and ready to depart for home.



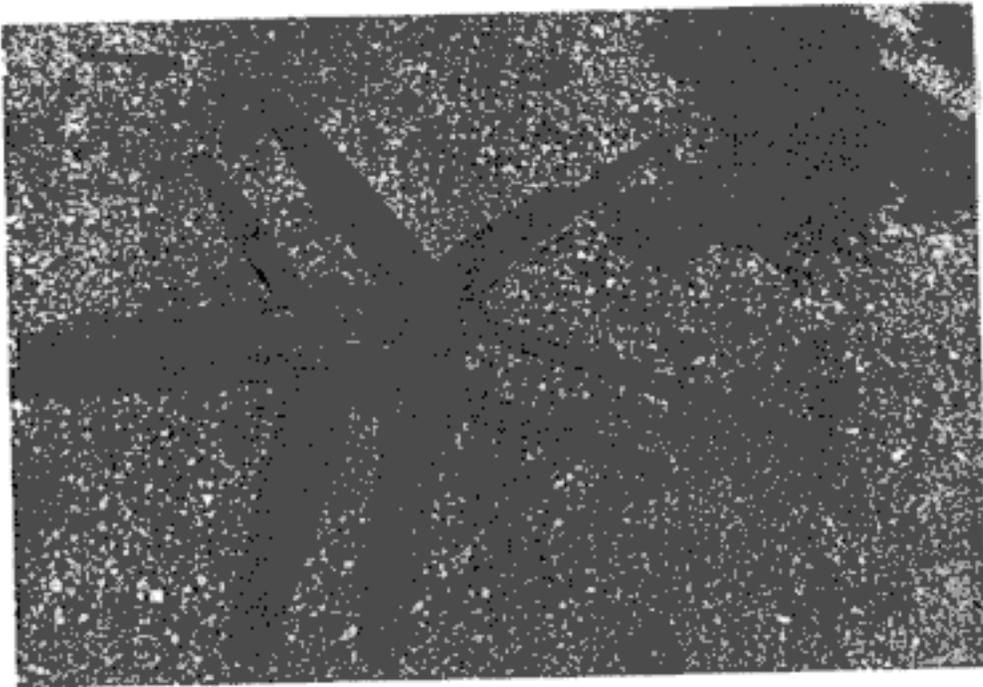
This is the glued up blank for the second four blade propeller that I carved and tried on "Die Fledermaus". Notice the squeezed out glue on the sides of it. I like to see this on a blank. It helps to prevent a "starved" joint. Resorcinol glue was used here.

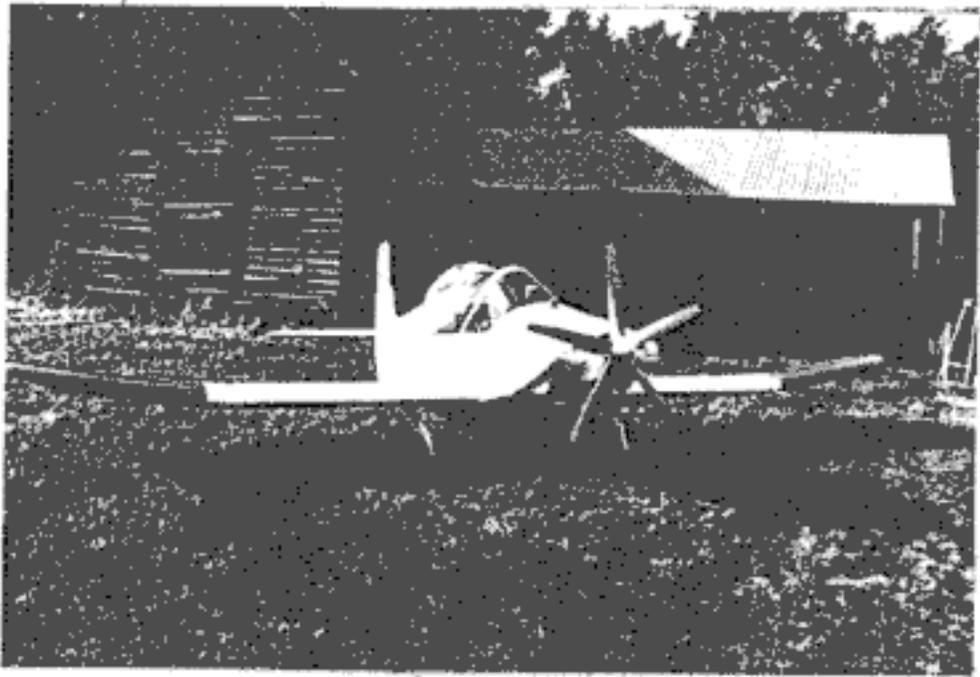


Both of these propellers had to be altered from their original pitch distributions in order to perform satisfactorily, then they worked very well indeed. The method shown on page 57 was used on both. This is where some of that "guessing" that I have been talking about so much, comes in. The fancy formulas can't tell you this!

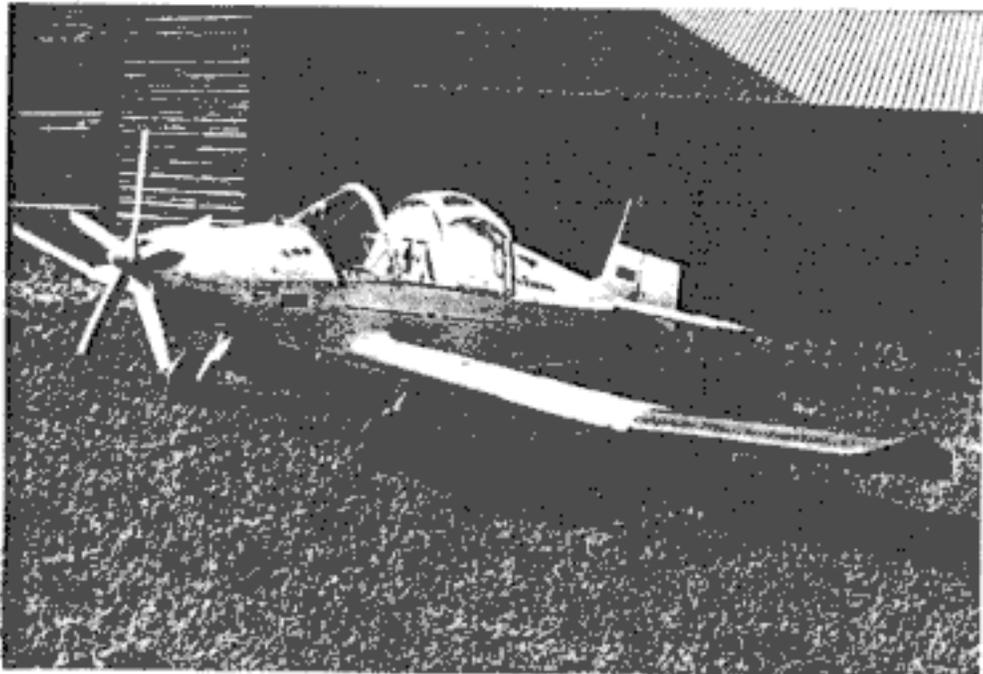


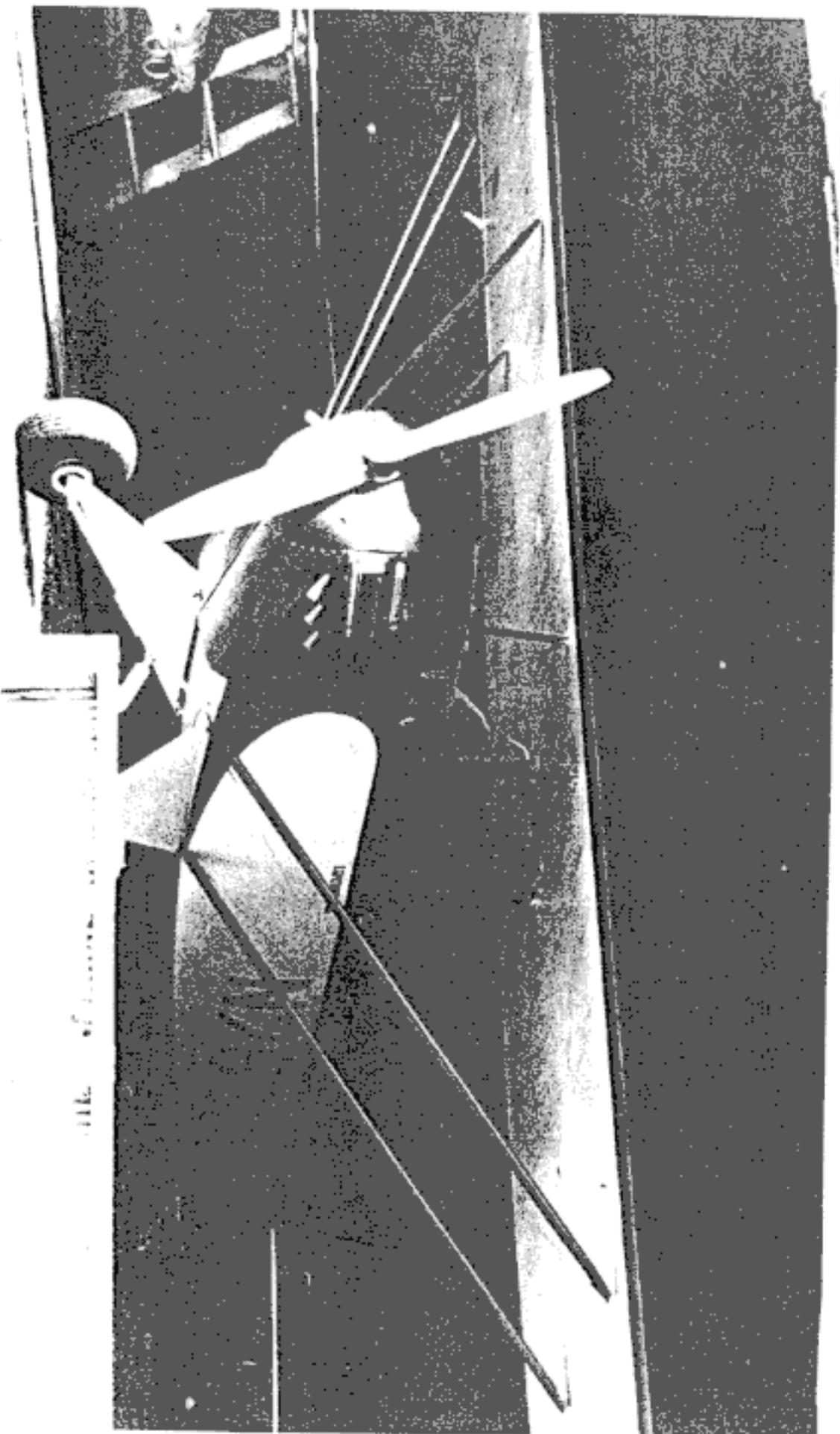
Some 5 blader pictures.



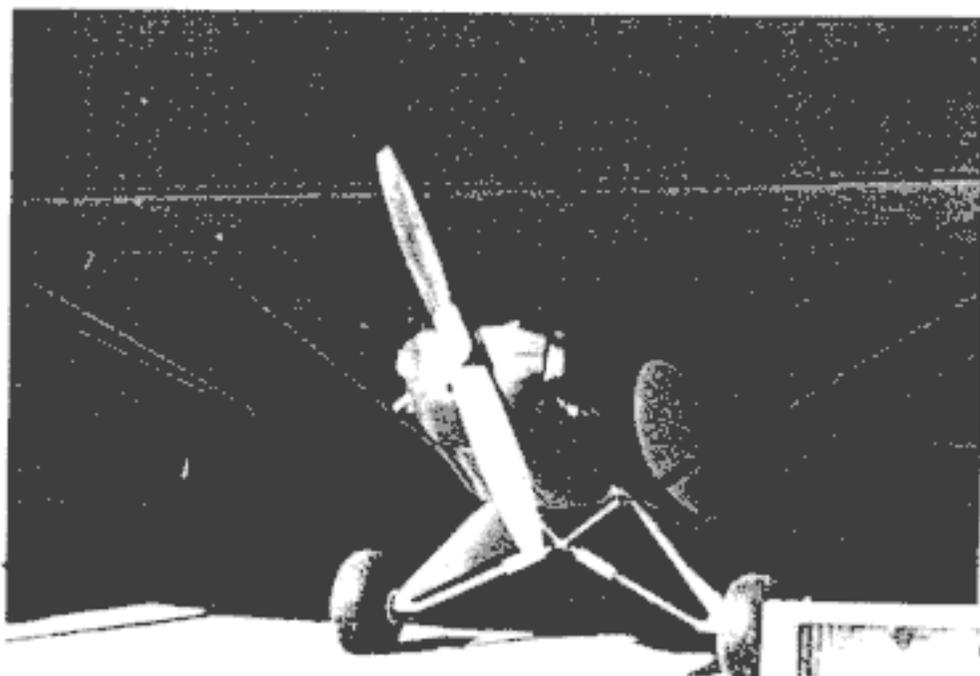


Here's a coupla "pitchers" of my five blader. Kinda snazzy huh?





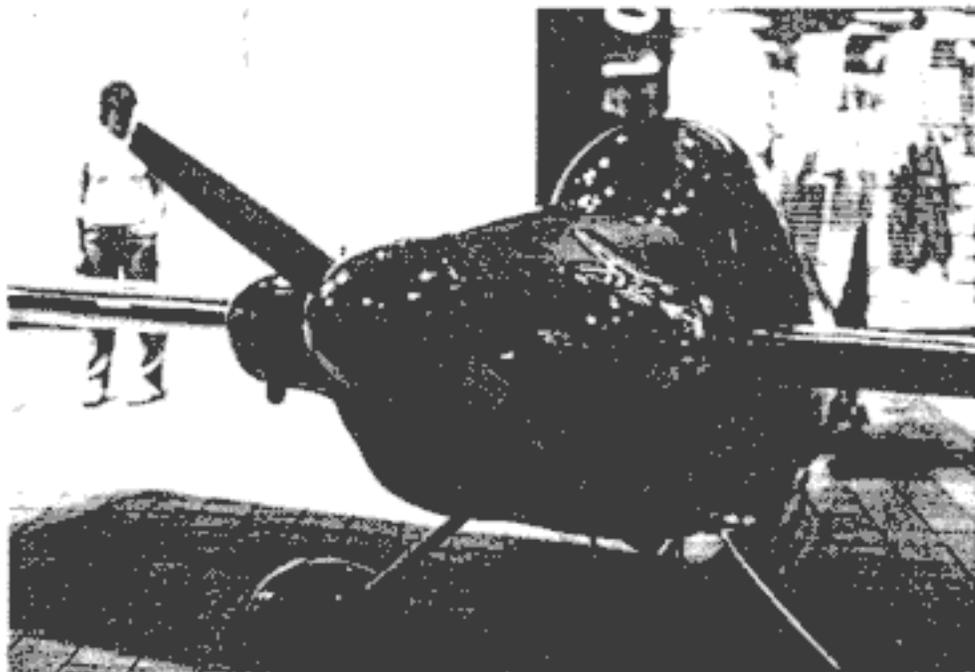
This is the last Alpcamper built by Bernie Pietenpol. It has a 164 cubic inch Corvair engine in it. It had just been put back into the hangar after testing the second propeller I carved for it. I tell about it in the next few pages of this book. Bernie donated it to the new EAA Museum in July 1983. I saw it there when I was at the '83 Fly-In. It was in the shop probably being readied for display. The prop on it did not look to be the one I carved for him. I saw it from the back side from the balcony, so I could be really be sure.



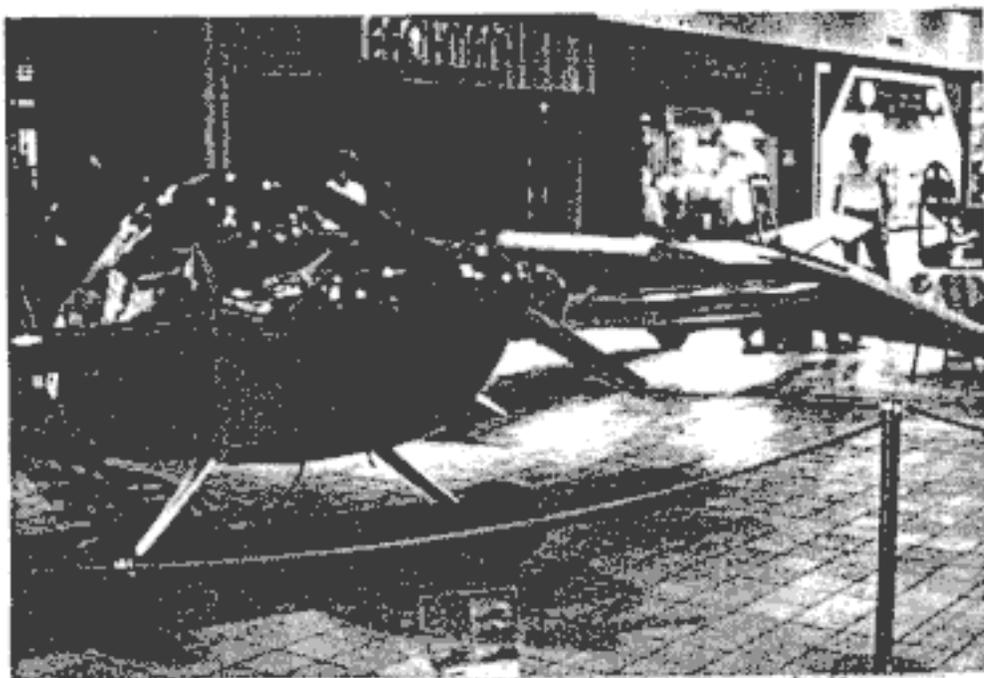
This is Propeller PKS-1-A on Bernie's ship.

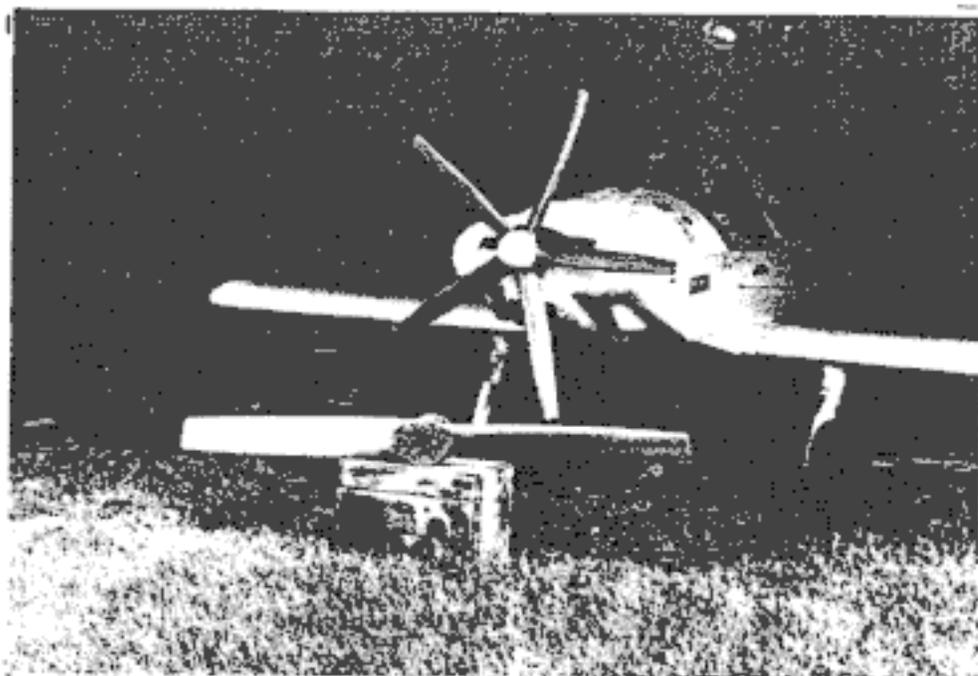


That is Propeller PKS-1 on this Newmaster powered Coby.

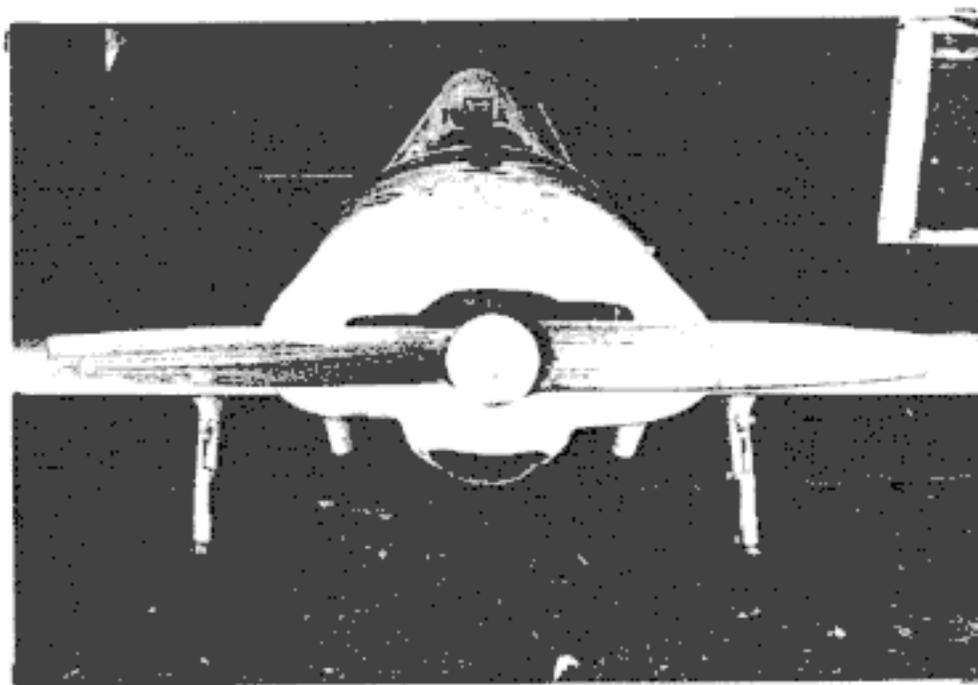


Here are a couple of pictures of that General II that I whittled those three props for. This is the EL-1, the best performing one of the three. I think that it is also the best of all the props that I have ever flown on "Die Fledermaus" as well. Our local chapter put on a display at the Valley View Mall at LaCrosse, Wis. This plane was one of our exhibits.

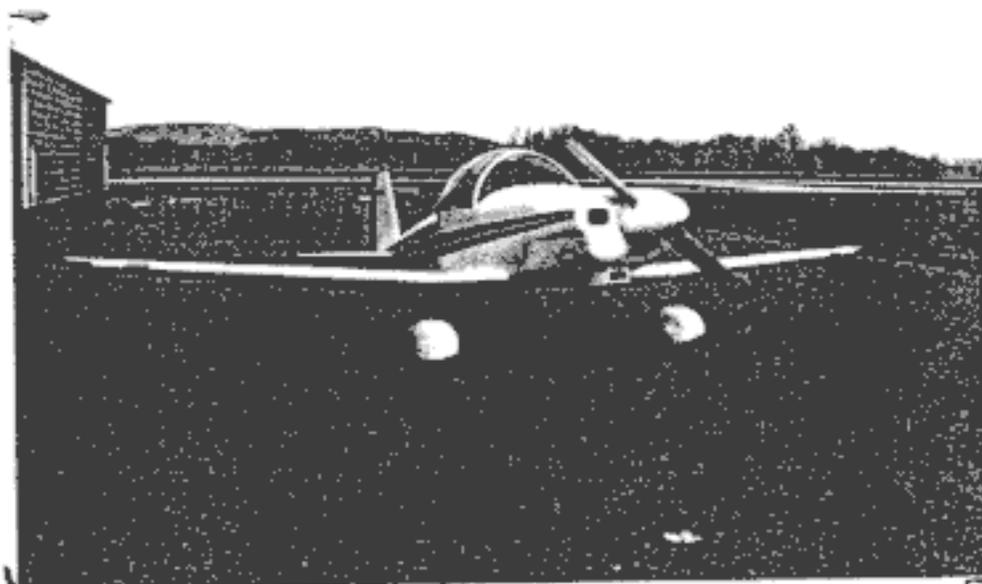




I got that five blader out and tried to smooth it up a bit but even though it ran very smoothly at static it still vibrated at slow cruise. That's the first prop I made for the Mustang II on the box in front.

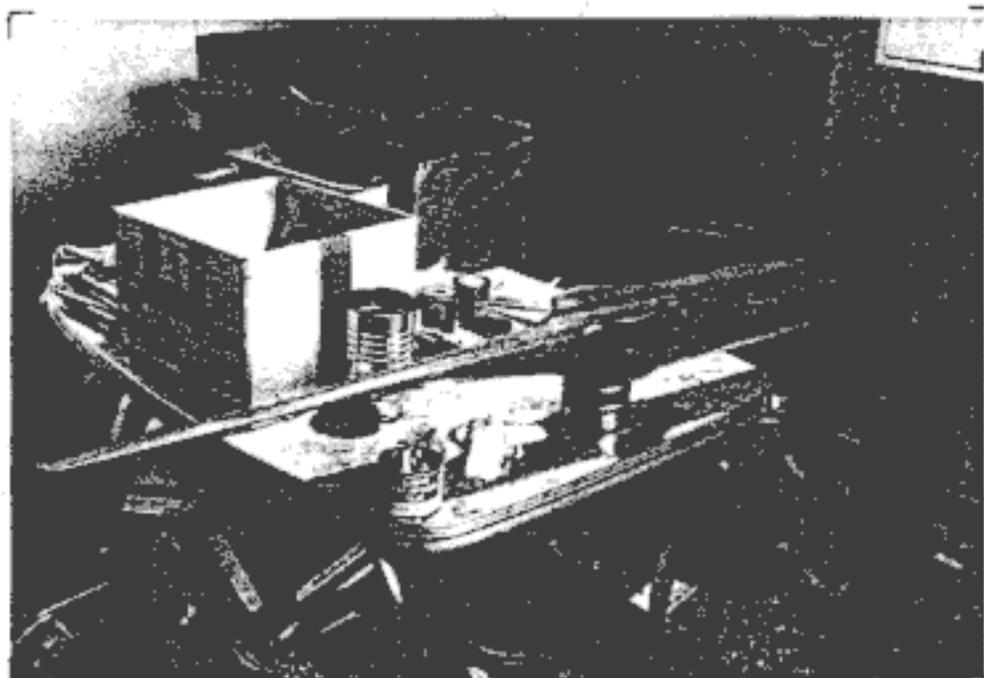


Here's that new BL-1 that I made for "Die Fledermaus" It certainly gives both good takeoff and climb and good cruise too. Its narrower blade and 2 in bigger diameter must have done it.



A beautiful ship with a wood butcher's prop on it.

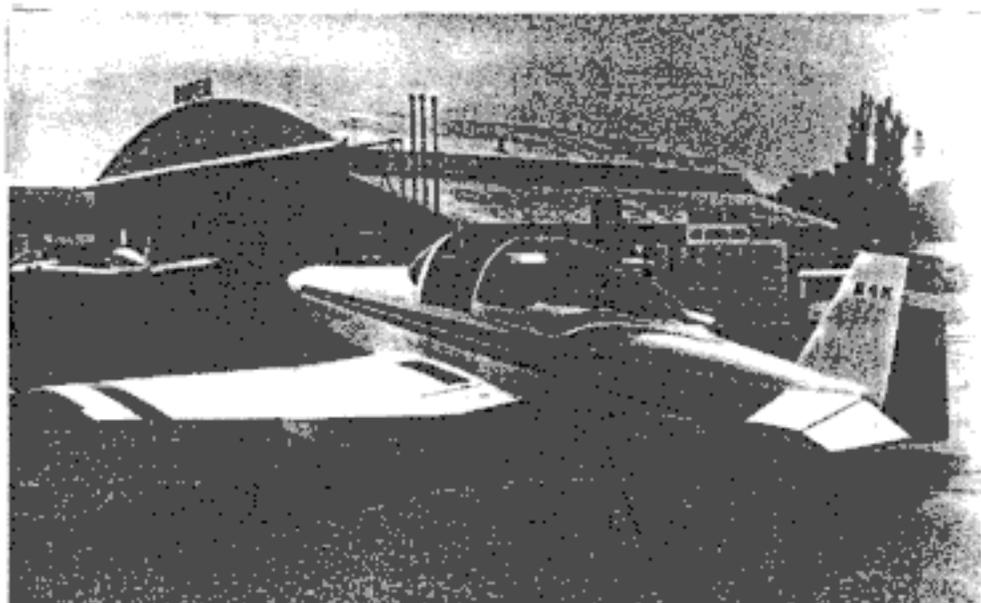
This is the first one I made for it. It had good takeoff and climb but it over revved badly at full throttle in level flight.

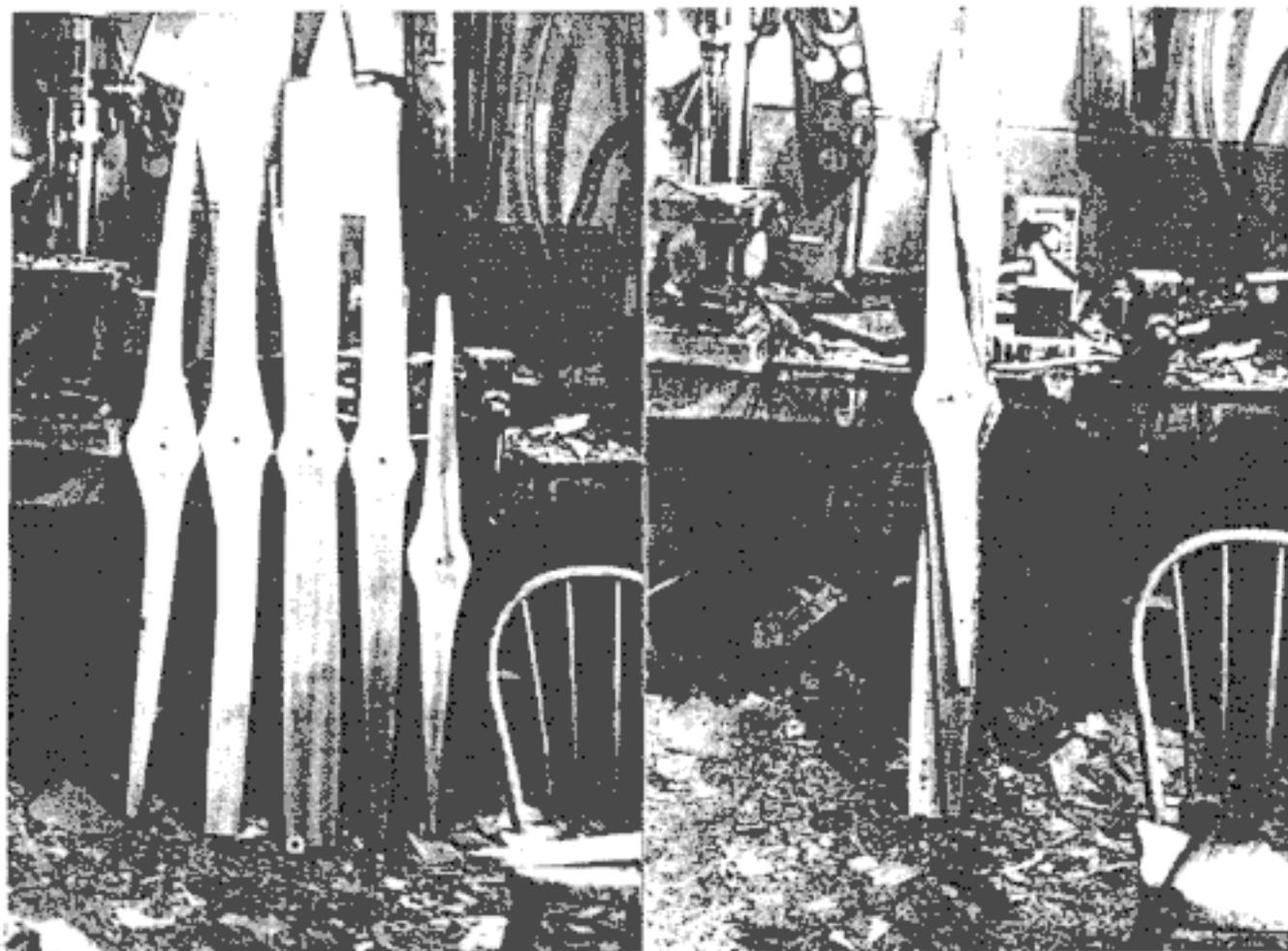


Here is one of the props I hacked out for it. There certainly was a good pile of shavings and dust on the floor when this one was done.

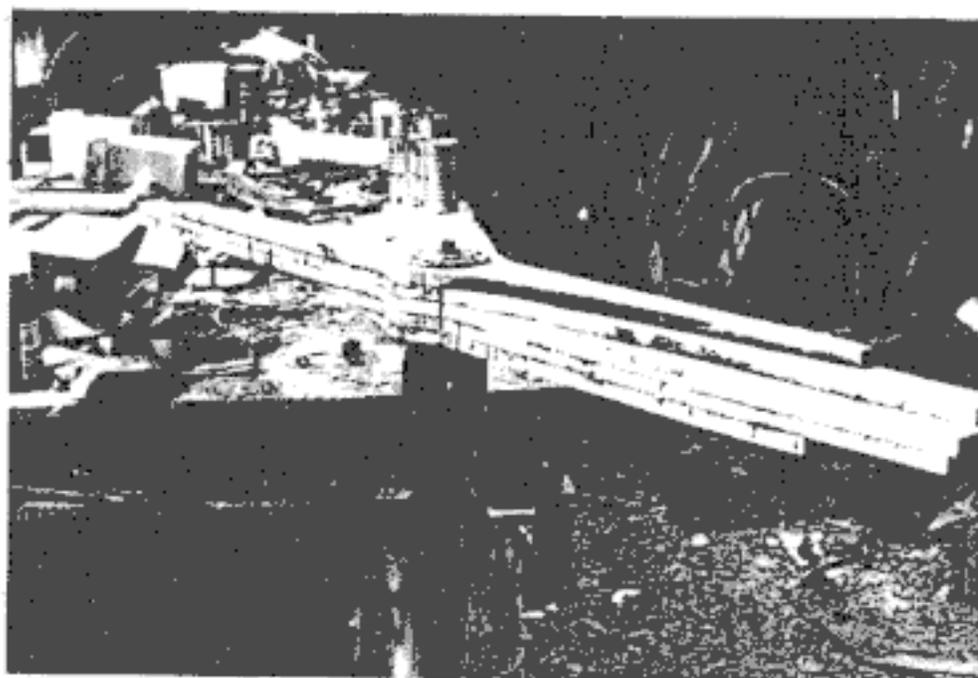


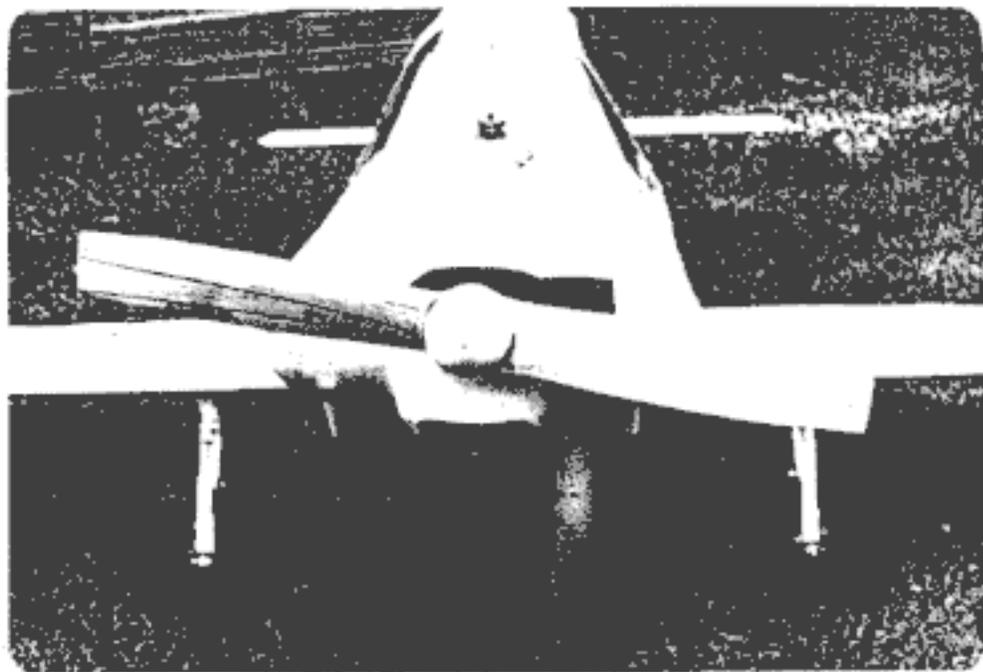
Here are a couple of pictures of that Mustang II that I tell about in the next few pages. I whittled two propellers for it. The first one I made would have been a good one to use for aerobatics. When the stick was pulled back at full speed it would go straight up like a Pitts for 1500 or 2000 ft. The second one was just about right for an all around prop. The original prop must have been made for a bigger engine, it had way too much pitch.



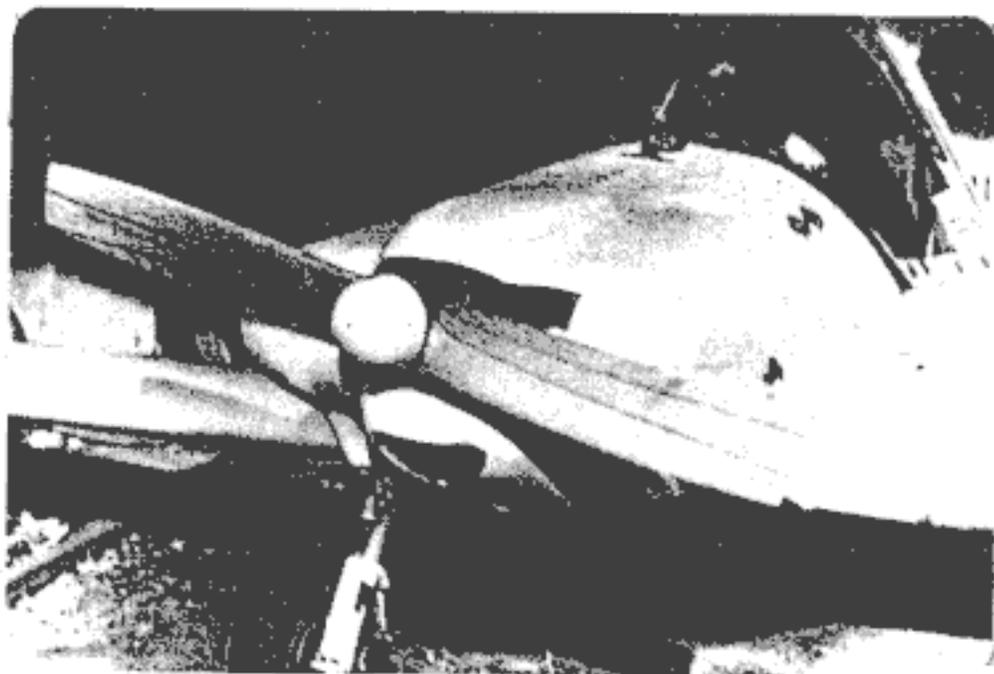


Here are a few pictures during the early stages in the construction of that prop for that Mustang II I am telling you about. It was carved from mahogany bought at a local lumber yard.





Two shots of the "Butter Paddle Special". Not much to look at but I thought I liked it better than any of the 16 propellers I had used before. It was smoother and quieter than any of them.



Fifty inches in diameter and 39.3 inches pitch at the tip. The blade is 5 inches wide at the widest and 4 inches wide at the tip. It is made of Ponderosa pine and weighs 3 lbs. It turns almost 2900 static and 3400 at 90MPH in a climb. I cruise it at 90 MPH at 2900 RPM on 18 inches of manifold pressure while consuming 2.7 gals of lead free premium gas an hour.