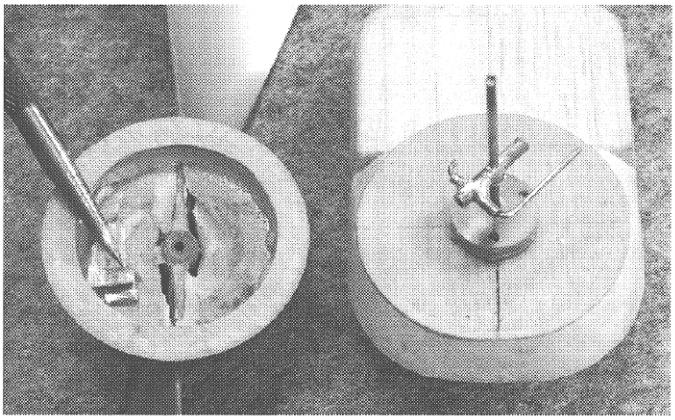
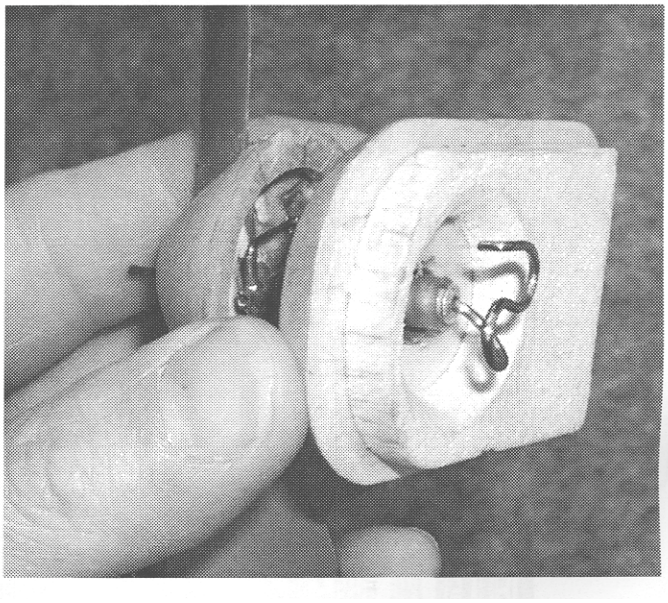
Spinner Clutch

by Dave Mitchell
Reproduced from the July/August 2006 issue of MaxFax, the newsletter of the DC Maxecuters, Stew Meyers, Editor

The aristocratic nose of my free-flight Aero A.10 has a wide, blunt spinner, which begged for an invisible and compact freewheel clutch mechanism. I came up with a design featuring a free-swinging bale wire (mounted to the prop shaft) that engages a ramped catch recessed into the back of the spinner (indicated by the pointer in the photo). Recessing the catch allows the spinner to be mounted close against the nose and maintains scale appearance.



To make the spinner:
1) Turn a piece of medium-hard balsa to the desired shape of the spinner. Glue a piece of 1/64" ply to the rear and shape to the spinner. Use a razor blade to slice off the portion of the spinner that will fall aft of the prop. Use a Dremel tool to grind out the center of this piece, leaving you with a reinforced ring.
2) Using a combination of advanced geometry, needle files and swear words, dry fit the forward portion of the spinner to the prop. Follow this by gluing the aft ring back onto the front portion, capturing the prop. Fit the assembly to the prop shaft and spin it to make sure the spinner runs true before gluing it permanently to the prop. Wait to make the ramped catch until after you have made the clutch.
Make the clutch as follows:
1) Using a drill press and a centering jig, drill two holes in a piece of 3/32" brass tube, at right angles to one another and about 1/4" apart. One hole is for the prop shaft; the other is for a short length of 1/16" brass tube that will carry the bail wire. Solder the 3/32" tube to the prop shaft, then fit the 1/16" tube into place and solder. You should now have something like a cruciform mounted at a right angle to the shaft (see picture).
2) Take a piece of wire, fit it into the 1/16" tube and bend both ends up. Make sure this "U" shaped bail rotates freely in the brass tube. Clip one end short; cut the other as long as you can and still have it clear the insides surface of the reinforced ring when positioned as in the above photo.
The ramped catch:
1) Cut a piece of brass sheet, about 1/4" x 1/2″. Form into a "C" shape, bending it around a piece of wire of slightly larger diameter than your bail wire, and leaving one leg longer than the other. File 1/8" of this long leg into a sharp point, and bend it down (away from the mouth of the "C").
2) Fit the spinner assembly to the prop shaft and make a line on the recessed surface of the spinner where the long end of the bail wire falls. You will use this mark to position the brass catch. Remove the spinner. Glue the long leg of the brass catch onto the recessed surface, forcing the sharpened point into the balsa. Make sure that you have positioned the catch properly to engage the bail wire cleanly AND that it is pointed in the right direction.
3) Use balsa to build up a ramp to the back side of the "C" catch. When the prop goes into freewheel mode, this ramp rides the bail wire clear of the catch. Saturate with thin CA and sand smooth.
4) Fit the prop and check for proper operation. The prop shaft on my unit pokes out through the tip of the spinner, and I retain the prop with a tight fitting nylon washer.
There you have it. The design works very well; the clutch engages positively, and has so far not let go in flight. There are two caveats to bear in mind, however: you will need to allow enough a long enough prop shaft (aft of the bearing) to allow you to get your finger in between the nose and the spinner to set the clutch wire into the catch after winding. You will also need to make the spinner an integral part of the prop, so choose your prop with care--or make a spinner with plug-in prop blades that will allow you to experiment. I have not spent any time at all refining this design; doubtless, there are improvements that could be made. Doubtless, as well, somebody else came up with something like this a long time ago.....



Needless to say this could be made with square brass tubing. I intend to adopt this for the P51 stew