

# FURTHER THOUGHTS ON THE STRUCK CLUTCH FW

By Stew Meyers

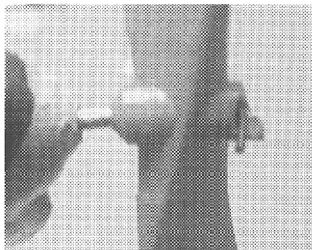
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The typical ramp clutch uses rubber tension to engage the clutch. In the drive direction, the torque arm is caught against the notch (vertical side) of the ramp. If the tension is not holding it in place, the arm slides over the ramp without catching and the prop free wheels in the opposite direction. If you use a braided motor to maintain tension and prevent bunching, this won't work.

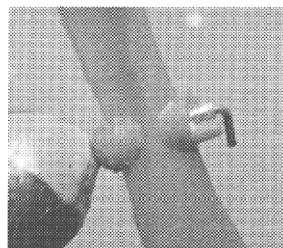
The Struck Clutch instead relies on torque for engagement. The spacer tube takes the rubber tension and the rubber torque forces the torque arm bent into the shaft wire into the notch of the ramp. The prop is allowed to slide back out of the way of the notch when the torque drive force is absent. The ramp is still there to prevent the arm from engaging the notch in the reverse rotation free wheeling mode.

When we use plastic props, the small hub diameter restricts the spacer tube size and does not provide much bearing area for the torque arm. With the typical 1/16 OD, 1/32 ID tubing available at the local hobby shops, 1/32 diameter wire prop shafts seem to be the practical upper limit in size. Enlarging the prop shaft hole for 1/16 clearance does not weaken it that much. If you were to use the more common thick wall brass tubing you would need to open up the hole to 3/32 and the hub gets too weak. 1/32 wire may work for peanuts and dimers but is too whimpy for me on larger models. Of course if you fabricate your own prop you can make the hub as large as you like and use a proper sized shaft.

Thankfully, K&S makes a thin wall brass tube #0537 1/16 OD with a 0.006 wall resulting in a 0.050 ID which will allow us to use a 0.047 (3/64") diameter wire as a prop shaft. (You can order this tubing from Shorty's Basement [www.shortysbasement.com](http://www.shortysbasement.com) 740-223-7471, if your local hobby shop does not carry it.) I like to bush my plastic props and use this tube for that purpose when I use a swing clutch with 0.047 wire. Before I discovered this thin wall tubing, I had to drill and ream out a piece of 1/32 OD aluminum tubing. For the Struck clutch the 1/16th hole must be reamed slightly to allow the prop to rotate freely on the spacer tube. Use a #51 drill (0.067" dia.). The notch on most plastic props needs to be slightly modified to accommodate an 0.047 wire torque arm, but not much especially if the torque arm has a flat filed on the face that engages the ramp.



Clutch engaged

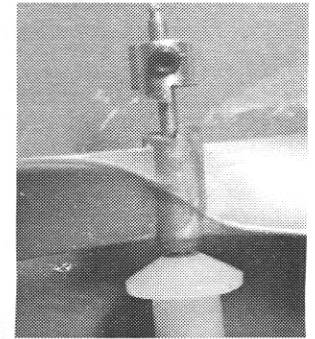


Clutch in freewheel

prop, some new possibilities open up. You can solder or hot stuff the spacer tubing to the shaft. (Ed. And let the prop slide on the tubing instead of the other way around.) You can then use a modified wheel collar as a ramp cam, which only needs to take the torque, not tension.



Ramp Cam Locked

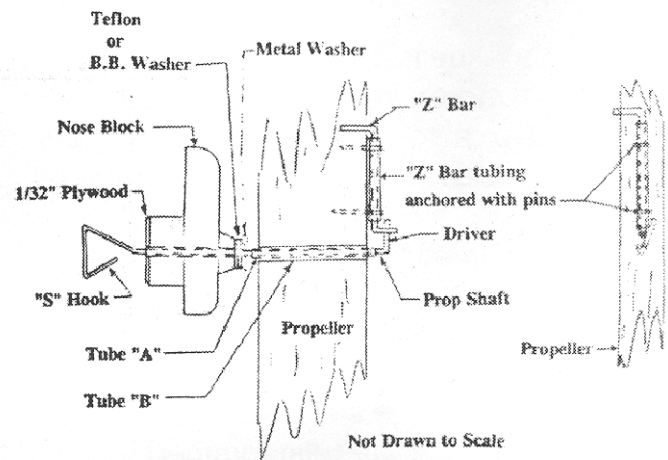


Ramp Cam Free

A flat filed on the prop shaft for the set screw greatly increases the torque holding capability. (Ed. Note: *This is mandatory in my opinion — you don't want this wheel lock to come loose — ask how I know!*) The brass spacer tube will be pressed in to it by the set screw. Or you can file a notch in the spacer tube as well for even more torque capability. You can now easily change props without bending a new prop shaft.

As you move up from a 0.047 prop shaft to a 1/16 or larger diameter prop shaft bending a torque arm in the shaft becomes more difficult. Using a wheel collar with a torque arm or ramp cam eliminates the problem. For those who are challenged by silver soldering, you can make a ramp cam from a piece of brass or aluminum rod. And by using a notch in the prop shaft you can eliminate the solder operation. For higher torque applications I would not trust the notch in plastic props. Better to use an external mechanism like the "Z" bar (See drawing below) to mate with an arm on the collar. Just use a long set screw for the arm.

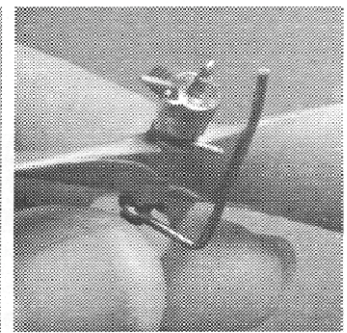
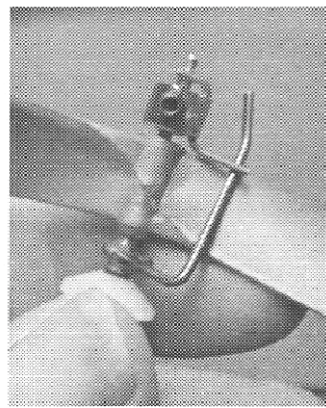
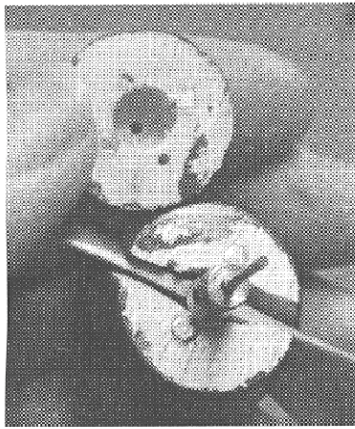
## 1930's "No Solder" free Wheeler by Henry Struck



The cam clutch (as pictured in the first four photos above — Ed.) is ideal for use with spinners. Keep the prop shaft long enough to center the front of the spinner. I use magnets to attach the front of the spinner to the base.

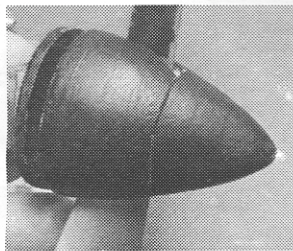
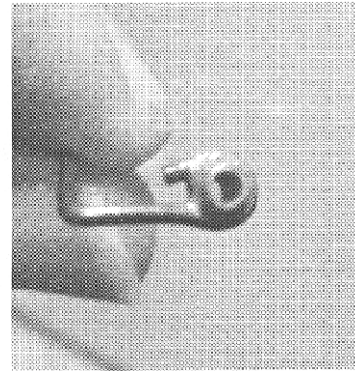
Ed. Note spacer tube behind prop when clutch is engaged. Once you realize the spacer tube does not need to rotate with the



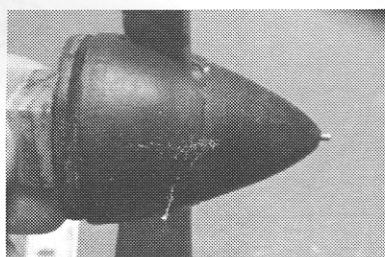


<Locked ^Free

Note the clearance to allow the cam to rotate in the nose piece during free wheeling and the extended shaft which provides a bearing for the nose piece and greatly reduces wobble. This shaft retracts in to the spinner when the clutch is engaged and extends out when free wheeling. This is an excellent visual indicator of clutch engagement. By removing the cam, prop blades can be changed. Of course you can also just use a bent wire, space tube, and prop notch for small spinners, but aligning the spinner on the prop is more difficult.



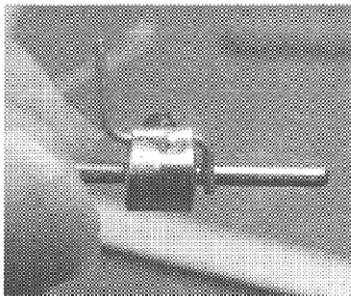
Clutch Engaged



Clutch Free

Note a drive bar is used to avoid having to drill the plastic prop. A small tubing spacer may also be used between the "Z" bar collar and the prop to provide clearance for the lock torque arm. Since there is a spacer tube this is not mandatory.

The "Z" bar can (also) be incorporated into the wheel collar to engage an arm on the prop rather than the other way around.



This "Z" bar clutch is made by filing a notch in a wheel collar and silver soldering a piece of 1/16h OD brass tub in it. Keep the tubing longer than the collar during the soldering operation to prevent clogging. File it flush afterward. (Ed. Note: Superior Props, 985-726-9673, sells this same device at a ridiculously low price considering the labor involved and can be used for either a balsa prop, or as explained below, on a plastic prop)