

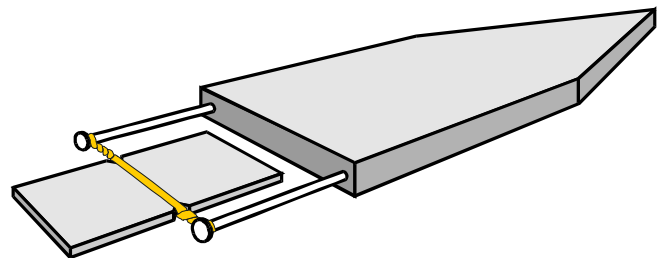
Adolescent Naval Technology of the Fifties

A few weeks ago I was investigating some old census records in the research room of the National Archive & Records Administration on Felix Avenue in Fort Worth. As I was threading an old reel of microfilm onto one of the readers, I was suddenly reminded of some of the wonderful projects that we toiled over, and were thrilled by, when we were kids in the fifties. The item that caused my mind to deviate from the search that I was pursuing was the plastic reel on which the microfilm was stored. It was an exact duplicate of the reels that used to hold 8 mm movie film and was probably left over from the time before there were such things as VCRs or minicams. I was once very familiar with these reels because my father owned a photo store in Tampa, Florida and one of my duties was to splice customer's small 50 ft. reels onto larger spools for which our family business made a fairly good profit. As a result we also had a large number of empty plastic film reels at our disposal and could use them for anything they might be useful for. I don't remember finding much they could be used for other than storing movie film or perhaps recording tape. But we did find one application that I'll bet the designers of the little plastic spools never could have imagined: we used them to propel model boats.

I think that as youngsters we were much more adept at entertaining ourselves than kids are now. As the oldest boy in our family, I would often start some creative activity and before long all of the younger kids and several of their friends would be emulating whatever construction project I was trying to make. It might be rubber band guns, kites, yo-yos, a tree house or model airplanes; once a project got started everyone joined in. In some ways our resources were more limited than those of our neighborhood friends but we also had free access to tools and materials that others did not. As a result we became proficient at "making do" and modifying things to suit whatever purpose we had at the moment. When it came to making self propelled model boats, our creativity hit an

all time high. Our design and construction of these watercraft evolved into a fairly close approximation of genuine mechanical engineering.

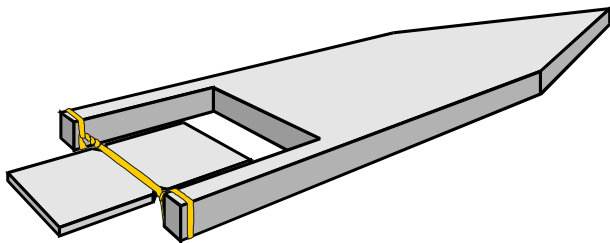
I doubt if anyone can explain exactly why we decided to devote ourselves to any hobby or project. Maybe it's similar to the reasons we go mountain climbing or cave exploring or why others may play golf or take up hunting. The way it worked was some kind of curiosity got into our minds and before long everyone was trying to outdo everyone else in building some Rube Goldberg gadget. What could be more fun? I know there were at least two things that started our flotilla of rubber band driven boats. We had an above ground wading pool in the back yard and we sometimes had shredded wheat for breakfast. In the fifties one of the popular breakfast foods was shredded wheat which was made by the National Biscuit Company. It came packaged in a box with pieces of cardboard used to separate blocks of shredded wheat. Nabisco printed useful information on these separators as an inducement for kids to persuade their parents to buy this particular product. Subjects of the text printed on the cardboard dividers might be how to do magic tricks, what we then called "Indian Lore," or instructions on how to make certain toys. One of these cards showed us how to make a paddle wheel boat out of a couple of nails, a piece of a peach crate, an old wood shingle and some rubber bands. Locating reasonable facsimiles of all of these items was no problem at all so before long I had a boat. All you had to do was wind up the paddle in the opposite



The original boat design was a 1X4 board sawed to a point on the front and with two 16-penny nails at the rear. A thin piece of wood was the paddle.

direction that you wanted it to spin. Then when you put your boat in the water and released it the boat moved forward. It worked well enough that all of the other kids wanted one too, and within a few days we were engaging in some pretty serious paddle boat races. When he could, my dad came to the back of the store to judge the winner.

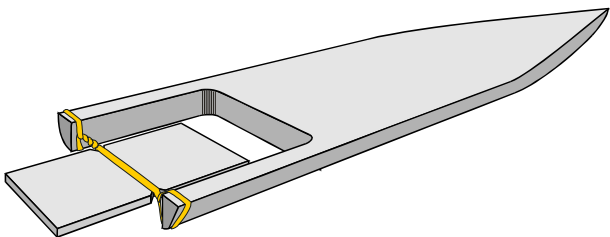
One of the first things we noted about the design of our boats was that it was difficult to make the nails stay firmly in their place at the stern of the boat. A nail hammered into the end grain of a piece of wood is not structurally strong. Add to that the fact that the boats were continually getting wet, then drying out revealed a basic design flaw that needed to be fixed. This was easily remedied by making boats out of longer pieces of wood with rectangular chunks sawed out of the back to accommodate the paddles.



A one-piece wooden body avoided problems of loose nails but optimum paddle size and rubber band strength needed attention

From there we found that by shaping the body of the boat with my dad's block plane and sandpaper, we got an improvement in streamlining which resulted in better performance.

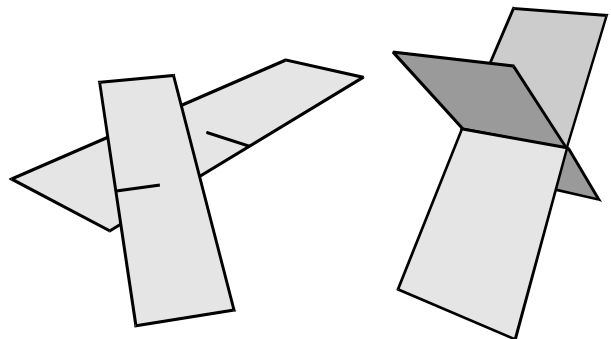
We messed around with fancy superstructures and cabins above the deck level but it seemed that the heavier a boat was the slower it went.



Shaping the hull with a plane and sandpaper and a good coat of enamel paint gave better streamlining and improved speed.

Thus simple one-piece hulls remained the design of choice. Next we tried to make our boats go faster and farther by putting in larger paddles and stronger rubber bands but this often resulted in degraded rather than improved results. Our fertile little minds reasoned that if bigger paddles and stronger rubber bands made for slower boats, that didn't go as straight, then we should try smaller paddles and wimpy rubber bands. After a lot of trial and error design work we got an optimized plan that seemed very difficult to improve. It turned out that extra width in a paddle took away space that was needed to kink up extra energy as the rubber band got fully wound up. Also a very strong rubber band just unwound in an instant burst of power as soon as the boat was released in the water. What was more desirable was a motor that would keep efficiently pushing the boat as it glided through the water. We played with short wide paddles and long skinny ones. A slat from a Venetian blind worked pretty well but we even experimented with Popsicle sticks for our paddles. Then we began to realize that having a paddle that floated was detrimental because the rubber band had to work to push the wooden blade down into the water. I experimented with metal paddles; pieces of tin coated steel scavenged from Campbell's soup cans worked very well. It was important to file down all sharp edges and round off each corner.

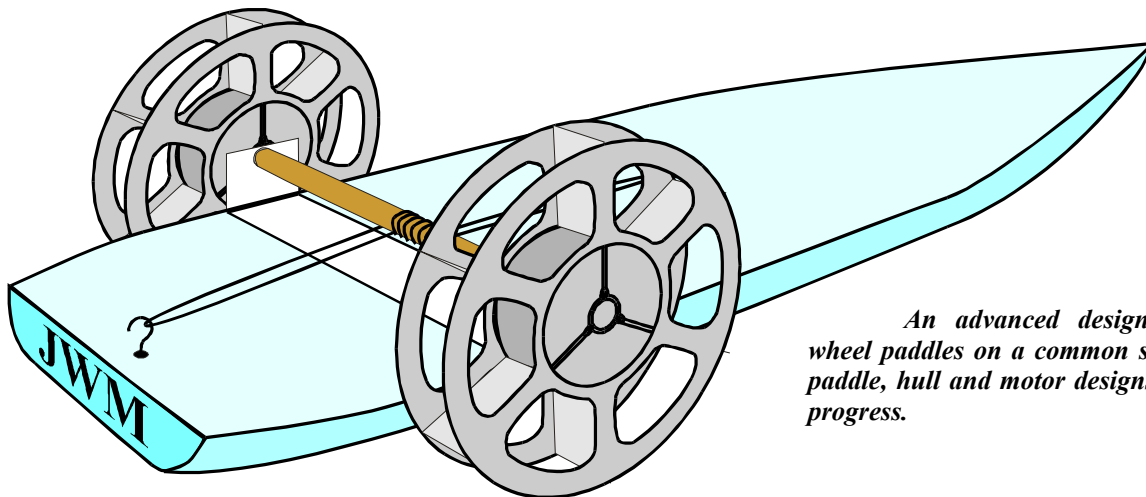
I next found that I could solder two pieces of metal together and get another improvement. This was especially effective in a tug-or-war game that we played. My improved paddle could nearly always drag any other boat across the pool.



Several variations in paddle design were tried. It was found that two pieces of tin from a soup can worked very well.

The next major design advancement converted our fleet from stern-wheelers to side-wheelers and it utilized some of those plastic film reels that I spoke of. It was really just an extrapolation of all of the design concepts that we had been evolving through. If smaller paddles that didn't float were good and if more blades per wheel propelled a boat better, then a design with six small blades on each wheel and two wheels on a boat would be the next logical step. I made a boat with two paddles constructed from movie film reels and it instantly moved forward the "state of the art" in paddleboat design. I tried to glue paper and then wood blades into the movie reels but the plastic these were made of did not accept glue very well. I went to metal paddles that were carefully cut out to be a little too big to fit between the flanges of the reel. I then heated up each of the six metal

blades with my soldering gun and they fused right into the plastic reel. It worked quite well. A piece of $\frac{3}{8}$ dia. dowel was used as an axle and metal from a soup can used as an axle support bracket. Small cup hooks screwed into the boat deck anchored the rubber band motor. It was around this time that we discovered that golf balls were constructed of rubber string which could be useful. We occasionally found lost golf balls while scrounging around the edges of the Palma Ceia Country Club. After cutting the plastic cover off of a golf ball we could unwind as much rubber as we wanted and make a perfect motor for our optimized paddleboats. This development in paddleboat technology was forgotten long ago but every now and then something pops up that makes me recall how different everything was and how many neat things we did back when I was much younger.



An advanced design used two side wheel paddles on a common shaft. Trying new paddle, hull and motor designs made continual progress.