BUILDING A HANDCAR

By Gene Tucker
Washington & Old Dominion No. 3

Some dreams take awhile to come true, and the building of a handcar (as well as a place and the time to run it) took twenty years to come true.

In the last year of my undergraduate work in Rochester, New York, I drove a school bus to earn money, often driving trips in the afternoon, when I had time, in addition to my morning runs. One day I was given an address on town line road, in Henrietta, New York. Not having a description of the place, I didn't know that there was an extensive collection of signs, other things, and an 0-4-0 tank steam engine, as well as a *handcar* and 150 feet of track. After showing the kids around the collection, explaining the workings of the steam engine (even in 1969, most of them had never seen one), and then offering rides on the handcar (with the owner and I on opposite sides, and with a student on each side). All afternoon, or what seemed like it anyway, we pumped our way up and down the track. It was so much fun! I decided then and there, that *someday* I would have a handcar!

My dream began to take shape when I found out about NARCOA early in 1988. From the outset, it seemed clear that buying a vintage classic handcar was out of the question (at least for me) due to the price. In talking with numerous individuals, found out where I could get axles, wheels, bearings and the like, and I began construction of my handcar in the fall. I was really ready for this project, since I had built a motorized track car earlier that spring.

"What!,...no babbitt bearings!" exclaimed fellow NARCOA member Jim Baird, when he saw my completed handcar last November. It's true, my car is not a faithful reproduction of the century-old models. It uses 16-inch Fairmont M-19 wheels, axles, bearings, as well as pillow block and flange bearings for the moving parts. It has a steel frame made of 1/8-inch channel and angle iron, bolted together for flexibility, .and I used a roller-chain drive. My thinking was that a modern car might be built of these materials, and that perhaps that the more efficient bearings might "make up" for the smaller wheels, which might make the car slower than it would have been, if I had fitted the car with the standard 20-inch size. In addition, the steel frame might make the car more durable than the original wood frame. Of course, the cost was a major factor. My car was built for about $400.00 (not counting a months work).

At this point, let me explain some of the technical aspects of my creation. Perhaps if some of you may be considering a similar project, you can avoid some of the mistakes I made. The frame is made up in two levels, somewhat like a Fairmont M-9 or M-19, with the bottom level serving as a support for the original M-19 style bearings. These are beneath the frame and bolted on with 5/8-inch bolts, and no spring suspension system. The brakes are a conventional type, but on one side only. The weight of my car is over 550 lbs., some 200 lbs less than many of the originals.

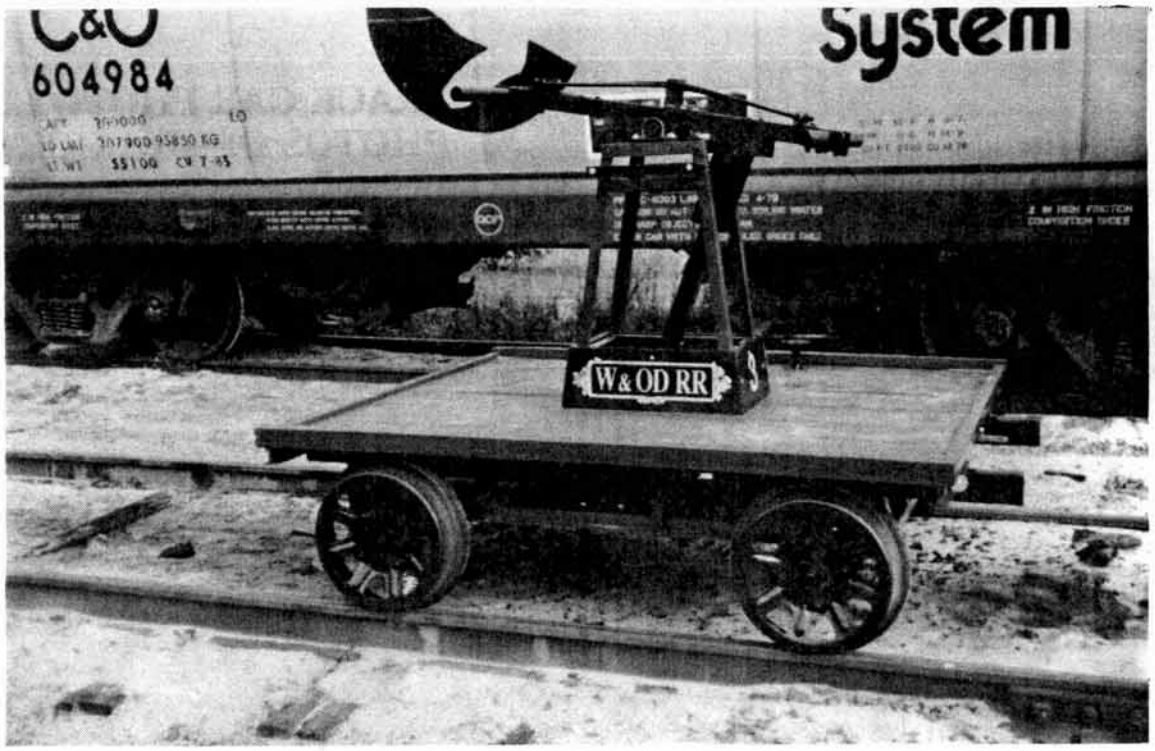
The drive axle with 16-inch wheels is 3.9:1, or in bicycle terms 3.9 x 16 inches = 62.4 inches (the equivalent of turning a 62.4-inch diameter wheel). Many of the originals that I've looked at have a 3:1 drive ratio with 20-inch wheels, giving a gear (in bicycle terms again) of 60 inches. Therefore, my car goes slightly farther, with each complete turn of the handles, about 16.3 feet. It is slightly harder to pump, due to this "stiffer" ratio.

The rod connecting the handles with the crank is set about 1/3 the distance out from the pivot on the handles, and the diameter of the crank on the driving axle is 12 inches, which I will increase somewhat to transmit more power to the axle with less effort on the handles.

The handles pivot on two pillow block bearings, and the rod connecting the handles with the drive axle has two flange bearings. The crank is a piece of channel iron 1/2 inch x 5 inches, and is fastened to a go-cart bolt hub, mounted on a 1-inch shaft with a 1/2-inch keyway. This is half the width of the car wide, and is supported by two pillow block bearings. The drive axle supporting the large sprocket, crank arm, and hub is only on one side of the crank, not supported on both sides like the original. This arrangement has worked out very well, even to the point of taking the "strain" of up to six people pumping the car!

I used no. 41 roller chain (it has been suggested that I use heavier chain) and this also has worked very well, to date. I used a 70-tooth sprocket on the drive axle, and an 18-tooth sprocket on the driven axle connected to the wheels. Since my car has a deck that is built out over the wheels, it can carry up to six people, instead of the usual four. This has been very handy in transporting volunteer workers on the Maryland & Pennsylvania Preservation Society's trackage in eastern Pennsylvania, to help clear brush and do other work along the right-of-way. The handcar is ideal for brush cutting, where workers will only move a few hundred yards at a time between work sites. I've also added tow hitches to the car so we can tow the car with motorized track cars to the work site, and then pump along between cutting areas.

We've retained the nostalgic look to the car by painting it in period colors. Also, my sister Deanna designed and painted a Victorian-styled logo for the



Gene Tucker's home-built handcar looks right at home on the rails. The car was numbered and lettered for the Washington & Old Dominion Railroad by Gene's sister Deanna. *Photo By Gene Tucker*

Washington & Old Dominion Railroad (an old favorite short line, that used to be in our area) with a number "3" painted on the sides and ends.

Would I do it the same way all over again?...Yes!...and I might even use 20-inch wheels, although there is a certain advantage to having the smaller 16-inch ones, permitting the larger deck. I *almost* enjoy pumping the handcar more than I do operating my motorized cars, partly because you can hear the "clank" nicely as you roll down the rails; plus, the exercise is excellent! The behavior of the machine over the rails teaches you the most subtle differences in trackwork...curves, kinks, and grades. But what a handcar really gives you a "connection" to the railroaders of yesterday, who used to pump one of these machines every day many miles, and then put in a full day's work beside.

REDUCING BELT SLIPPAGE

By Dick Ray
Western Maryland M9, No. 67

Although Fairmont recommends not using belt dressing on the endless cord belt drives of its two-cycle engined inspection cars, I have been using a small amount of powdered rosin on the belt of my ex Western Maryland M-9 for some years now. The reason for this is to lessen the tension on the belt, while providing enough friction to drive the car.

Powdered rosin can be obtained from a baseball pitcher's rosin bag (available at most sports supply stores), or by scraping the material from a string musician's rosin block. Only a small amount is needed, and once it is worked into the belt, it does not need replenishment.

Before applying the rosin, I cleaned the belt with detergent and a wire brush. With the car jacked up and running, I hosed the belt clean and let it dry. Then at the next outing on the rails, I wiped the rosin into the belt and ran the car. Several applications were needed, but afterward the belt ran with less than half the tension required previously, judging by the force required on the belt lever.

Several owners that I have talked with have observed that belts seem to fail, due to broken cords. When enough of these cords break, the belt tends to stretch badly in use. Adding the rosin should lengthen the belt life, by reducing the force which causes broken cords. Also, the force on the engine and idler bearings is lessened.

One last note; the rosin causes the belt to squeal as it is engaged. This annoys some people, but I think a slight squeak or two is the sound of ideal belt tension.