



Cyls - 2 1/4 x 3
 W.H.S. - 5 1/4
 W.B. - 1 1/4

BURIAL - 6 1/4
 GAUGE - 8 1/2 x 5 1/2
 TUNES - 1/2 O.D.

WHEELS - 5 1/4
 CP 9/16 1/8

1/4" = 1"

7/16 GA. CP 9/16 1/8

1/31/99

Dear Bernie,

While I was looking for some other things all the drawings for the "Minnie" were found; I think these may be of help to you in the completion of that loco. The boiler one shows some of the "innerds" which are not visable from the outside. It is very much like the drawing. The top row of tubes is somewhat of an inovation; there have been three locos built here them arranged that way. I have found that the conventional thinking that the air opening should be in the rear of the ash pan does not work as to the drafting and the even burning of the fire. With this arrangement, when one thinks about it, there is the possibility that there is more reason for the fire to burn faster toward the back. The latest one out of the shop here as this arrangement of the tubes to a much further extent than the boiler you have, and with the ash pan opening only in the back, as for conventional drafting, there was no fire in the front to be seen. This was corrected by giving an equal opening to the front of the pan, and an even fire was acheived. This tube instalation does much the same as an arch without the burning-out to which these are subject. But the top row which are the longest should be well soldered to the crown sheet so as not to burn; the others may burn away in yours until they get to the point wwhen they are of the length that all the heat they absorb is being transmitted to the water. In the 3½" locos here which have this instalation I have seen no burning of the tube ends, and expect that this will be the case with yours.

This shop has been working on two locos this and last winter; one is an ½" scale 4-6-2 which was built in the '30's by one of the sons of W.H.Nichols of the miller fame. The chassis was a "tool-room" job, and suffered the consequences of a "too good" fit. One of the main bearins "picked up" and we were lucky that this was cured wothout having to have a wheel pulled. In this size loco it is very rare to find any attempt to split these for easy dis-assembly. Now the chassis is in good order and a bit more work in the smoke-box will have her ready for the real test as soon as we get through the mud-season. The other is a 3½" 4-4-0. This was worked on last winter and summer and tried out in the fall. This showed what was no^fas it should be, and this one also will be ready for a track test in the spring.

We were out to the track at Washakum Live Steamers just a bit west of Boston, and they will have one of the finest tracks anywhere; 3½", 4 3/4", 7¼"; the 4 3/4" is common to both tracks. The elevated and the ground. That track is about an hour's run from here; Cap (my son) and I hope to check it out this comming season! He is squareing away a 7¼'ga. "Titch" this will give him an easily transported "big" loco.

Hope all is well with you and yours; please give my regards to Jimmy when you see him.

Charlie

P.S. Boiler deqs. in a mailing tube

Bernie,

As I think of things which may not be on the drawings, or may not be clear from just looking, and the ones which are not apparent. As they come:

On the top of the firebox end near the front right hand corner there is a small plate held on by a #6 bronze screw; this covers a hole through which the stand-pipe to the dry-pipe was installed to the forementioned dry-pipe. This could be used to straighten the throttle tube if needed. Melt and turn, and there it is. The top of the stand-pipe is enclosed in a box about 2" square in that front corner; this is, in effect, a steam-dome. All bushings in the boiler are tapped 3/8"-24 straight thread and are brass. Over the years I have never had any trouble with these brass bushes and brass hollow bolts; some of the Brits get all excited about "gun-metal" bushes. This is not obtainable around here; thus what can be bought is used. In years long gone by when brass was used for bolts or fittings, we didn't bother to blow-down boilers after running, and let the water set in them until the next run; this was the cause of the "rotting" of the materials, I think. If the bush and the fitting are of the same material and assembled with "teflon" paste, and the boiler blown, I have not had any failures. But if the "inspectors" get a burr under their saddle, try tinning the bushes, and then tap 'em with a dull tap.

You will no-doubt find some body who has never seen a "backwards" Stephenson; be not dismayed. That is what this is, and it works. The links will be in the top position for forward motion; unless the gear is wanted in a "crossed-rod" configuration. This is a full Stephenson in this loco; you just can't see some of the outsides of the bits. All is case-hardened, and the spring just gently makes sure that the parts stay close to each other all the time. A few drops of cylinder oil on top of the lot will keep them happy for a long time.

One place I see for a future problem are the bushings for the main-driving axle; there are oilite bushes in the four main axle boxes. I have a feeling that the main boxes will wear enough to need re-placing long before the leading ones do. Had this stayed here, I doubt that this would be necessary in my life-time, but I hope it does in yours! I think rectangular cast-iron boxes would be the best way to go. Remove the rectangular box holder; mill a slot, and put the new boxes on the axle halves, and reassemble this assembly in the "collett",

On the backhead: The two bottom bushes are intended for blow-down valves. The next two above for boiler feed; however, if you are clever enough, both the blow-downs and the boiler feeds can be put into the bottom bushes. The water gauge bush is just by left side of the fire door, and the top one is the middle of three just at the rear of the top of the boiler. The rear one of the three I had intended for a turret for steam valves for various purposes. Blower, injector, pump, and a cylinder heating system. The blower was to go from the turret valve to the rear of the left-hand through tube, the throttle to the right hand. The thought of running the blower through the left-hand tube was to superheat the blower steam so as not to have condensate when using the blower at a low rate. In other words: A non-spit blower. This was to be just another unusual feature. You may do as you chose.

Another detail you do not need! If you look closely at the front and back of the cylinders,

and copper bushings

you will notice that there are a lot of plugs. These are a grid of holes interconnected like a radiator for the purpose of heating the cylinder block with high-pressure steam. There would be lines to the top holes in the top of the back of each cylinder and lines back to the cab to regulate the drains. The way to set these up would be for the top line valve to be opened a good bit, and the return valves in sight in the cab would regulate the amount of drip. This being set so as to drip a little of both hot water and steam. This would ensure boiler pressure steam in the cylinders of about 300 deg. (F). This is the reason I had no intention of a superheater. 1/8" dia. would be ample for this duty, if you want to give it a try after you get the loco de-bugged.

I had named this one "Minnie" as a small edition of the "Minnitronka" of the Great Northern's first locomotive; you will note the similarity of the side-elevation drawing.

Just re-reading: The third bush forward on the top of the firebox would be used for the top connection of the gauge-glass, and the one to the left of the fire-door for the bottom connection. Guess that's about all for tonight. "Good Night!"

When you're piping up the water pumps. On most of my locos the hand pump and the axle pump are done in series with the amount pumped regulated by a "lazy-cock". This is a restriction valve in the suction line to the axle pump. This needs to be made so as not to completely shut off the water flow, but to allow a small feed to allow the axle pump to be lubricated. This must also be opened when the hand pump is used; if not the water flow is very low. This method of feed requires a "bleeder valve" in the delivery line between the axle pump and the boiler check so as to relieve any air in the system. With this plumbing system the axle pump has to pump no more water than is needed. Not a great amount of flow at the pump being returned to the tender. It's a big surprise how much work a pump does just pumping water back to the water supply. Also with this system there are a lot of check valves between the tender and the boiler. Two in the hand pump, two in the axle pump, and the boiler check. Also, if there is a stuck check in the axle pump, you can usually free it up with the hand pump. If you pipe the bleeder to the side and leave it open a bit, there will not be too many by-standers standing too close to the right of way!

The loco axles are hollow drilled through the outer ends and an adapter for a grease gun with a point will deliver lube to the main bearings; the rest will have to get along with a splash system.

There are a couple of pieces of 1/2" square stock between the motion bars and the main frames. These are there just to hold the chassis level. The loco is designed for "three point suspension". Two being in the center of the fore and aft axle suspension bars. The third is to be the connection between the front of the tender and the back of the loco frame. There is a hole drilled in this cross member; you can use a regular "eye-bolt" here or make something fancy. This and a fork on the front of the tender is the third point of the suspension system. I have used this on another 0-4-0, and it has worked out very well; one thing that's interesting about this method is that the loco tracks beautifully when running backwards! The tender makes a wonderful leading truck, and the dirt is behind the engineer.

The brake shoes and the brake hangers are one and the same piece. When somewhat worn they can be reversed and used again. The adjustment of the brake lever travel is self-evident. The tender trucks are some "quick and dirty" ones made for testing the loco, and the wheels can be later be used on more formal frames. My experience has led me to using one of the "craft" shop ball thrust bearings between the truck bolster and the car body to take the load. The best diameter of these to be about 1/2 to 1/3 of the track gauge. The center pin can be a bit loose and it's basic function is to keep the truck centered under the car and to keep the truck with the car. The wheels to be independent (free) on the axle; this will allow the truck more easily to go 'round the curve. I've tried them both ways here on the track and this is the result of trials. It's, no doubt, true that the tapered wheel will go 'round curves better at speed and center itself on straights, but on our tracks this taper doesn't seem to last. Thus, the loose wheels and parallel treads. Much easier to make, too.

The round head screws in the top of the banjo ring bolts in the top of the steam chests are for the purpose of putting oil into same. And along this line the hole in the top of the smoke box just in front of the stack is for the tube to the snifting-valve. This placement was used by Harry Sait of Old Orchard Beach, Maine in locos in times long gone by, and I have used the same in almost every loco of mine. It's just a check valve between the steam line to the cylinders and the atmosphere. It is closed when the throttle is opened and open when the loco is drifting. This relieves the vacuum in the steam chests with warmed air and also allows the spout of the oil can filled with WD40 to be inserted and the super rust preventer to be sucked into said cylinders when the loco is pushed forward in fore gear and vise-versa. This did NOT get done in the little guy and caused the stuck piston.

Beware of the inside of the firebox!! I cut off the ends of the stays with a bolt-cutter, and the ends of these are very sharp. If you were to go mucking about in there in the dark, your hands would look like you had had a run-in with porcupine. Lots of very sharp ends; I know! and I remembered!

The two holes in the pilot beam in-line with the valve stems are there for the setting of the valves on the valve stem. I think that this bit is AOK, but don't go putting a big fat finger between the valve stem and said pilot beam when the loco is in motion.

There is a hole in the side of the smokebox. This could be used for the blower if you do not want to run it through the pipe in the boiler as mentioned before. Also it could be used for a steam pump exhaust.

The wheel castings source is unknown, but they are about 50 or 60 years old. Possible source Mr. V.V. Hubbard who built in the 1930's.

Well, I guess that's about all I can think of; so good luck and pleasure,