

The
NEMES
NEW ENGLAND MODEL ENGINEERING SOCIETY INC.

Gazette

No 295

January 2021

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January Meeting

Due to the coronavirus pandemic, the January 2021 meeting will be held on line. The meeting will be on January 7 2021, at 7PM.

For details of how to get the on-line meeting, please see Dan's President's message.

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**Club
Business**
Rich Baker

DUES: 2021 Dues are now past due.

We are collecting the 2021 NEMES Dues now. Invoices were sent out from our Square Credit Card processor later this month. The invoices have a link to pay online directly to Square. If you want to pay by check, please mail the \$25 check to NEMES, 288 Middle Street, West Newbury, MA 01985. Thank you for your continued support for NEMES.

APPAREL: While paying for dues, please check out the NEMES Aprons, T-Shirts, Denim Shirts and Sweat Shirts. We are happy to ship any of this clothing directly to your home. They make great Christmas presents.

Meeting Announcement
All NEMES Members

I hope you can join us for an on-line NEMES meeting on Thursday, January 7, 2021.

Daniel Eyring is inviting you to a scheduled Zoom meeting.

Topic: 1/07/2021 NEMES Meeting
Time: Dec 3, 2020 07:00 PM Eastern Time (US and Canada)

Join Zoom Meeting
<https://zoom.us/j/6229563584?pwd=eHVmSmdBWFE5ZDRQUVZBWHZJV0NtZz09>

Meeting ID: 622 956 3584
Passcode: 072169

One tap mobile
+13126266799,,6229563584#,,,,,0#,,072169# US (Chicago)
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Find your local number:
<https://zoom.us/j/6229563584>



President's Corner
Dan Eyring

President's Corner
Dan Eyring
January 2021

Welcome to a New (and hopefully better) year!

Last month, on behalf of the Charles River Museum, I received an interesting offer from Arthur Anthony of the Massachusetts Charitable Mechanics Association (MCMA - https://en.wikipedia.org/wiki/Massachusetts_Charitable_Mechanics_Association). The MCMA was founded in Boston in 1785 by Paul Revere and other prominent Boston mechanical artisans "for the sole purposes of promoting the [mechanic arts](#) and extending the practice of benevolence."

Some of you may know Arthur in his family's capacity as proprietors of The Mystic Valley Foundry.

On behalf of the MCMA, Arthur was offering to loan the Charles River Museum a model of an English steam engine, described by the Smithsonian Museum as “a teaching model of a beam steam engine, made about 1830 by Bancks of London and now on loan from the Massachusetts Charitable Mechanics Association”. The model has recently been returned to the MCMA from the Smithsonian and Arthur is looking for a new home for it. A picture of the Model (about 24” on a side) is shown below:



The CRMII Director and I have indicated to Arthur that we would like to accept the loan of this 190 year old model and the MCMA will review the loan at their next Board of Directors meeting.

I have invited Arthur to our January monthly Zoom meeting to talk about the model and his many other interesting activities. I hope he will be able to join us.

Stay healthy this New Year and get vaccinated early and often!

Dan



From the
Editor's Desk
Bob
Timmerman

Dick Boucher writes about his model building

Dick is writing the articles for his family and friends, and sometimes puts in personal details. While I edit out some of them, I have been leaving some of the details in, as I would hope that NEMES members would like to read about what fellow members are up to.

I am contributing some words about unusual screw thread systems the people might not have encountered.

I have used the new system to pay my dues, and it works well.

Future Events

Pretty much everything has been shut down because of coronavirus. If anybody has information on a meet, please send it to me, and I will publish it. Please see the following notice on the NEMES Model Engineering Show

NEMES Model Engineering Show

The NEMES Model Engineering Show will not be held as scheduled. It will be postponed until late Spring/Early Summer. The Show, or parts of it may be held outdoors, which will make running of internal combustion engines easier. We may still have compressed air for steam engines, but for steam engines, BYOB (Bring your own boiler) may be possible, if the boiler has a current Massachusetts State inspection.

Reports from the Sandy Hill Locomotive Works

This is Dick Boucher's original introduction, and I am reprinting it here, as I think it is still relevant.

June 7, 2020

Hello fellow live steam model hobbyist and principals of the New England Model Engineering Society,

James (grandson), Norm, Jay and John. This is my usual Sunday afternoon progress report on work here in the Sandy Hill Locomotive works. Dan, Rich, Bob and James Scheffler I am sending this along to you thinking it might be a way to get some interest back in the club if the fellows who have given up traveling to Waltham had a place to post pictures of their work and view other builders projects. To the new fellows on the list I am working on Cole's Models 2"scale Case steam tractor. For some time now I have been sending out pictures and a short description of the progress on the project to the first three listed having added John lately. Back in the early days of the Live Steam railroad hobby there were only a couple "meets" a year some as far away as Montreal Canada and Carl Purington started the "Traveling Locomotive Books" in which a hobbyist would attach a couple pictures of his work and forward the book to the next person on the list. Fortunately these books still exist and are repositored at John K's museum in Beverly. At any rate my thought is we set up a formal place in our web site or someplace to create the "Traveling Hobby Machining Books" Your thoughts.

All for now, stay cool and stay healthy,

Richard L. Boucher
Chief Engineer/Master Mechanic/ Lead Machinist
Sandy Hill Locomotive Works

Recent work

SHLW report Nov 29,2020

Hi All,

First of all let me wish all of you a belated Holiday Wish. I say belated because as I write this missive I just realized it probably will not be in print until the January issue of the Gazette.

I didn't get any model work done in the shop this week I decided it was time to sort out various racks and stacks on the floor of the materials I have here in the shop. Big mistake I should have let sleeping dogs lie. Photo 1 shows the shop this evening before I started to write.



Photo 1

Stuff piled up everywhere. Photo 2 shows one of the racks I have made from PVC pipe



Photo 2

and Photo 3 shows it on the shelf with stock neatly stored in it.



Photo 3

The top left hand shelf of the of the unit still needs sorting but the left hand side shows the nice neat selection of flat stock just waiting to be used for coming projects. Round stock will be on lower shelves.

As always stay safe, stay healthy and stay sane. Head down to the shop and build something cool. Dick B.

Richard L. Boucher
Chief Engineer/Master Mechanic/ Lead Machinist
Sandy Hill Locomotive Works

December 6, 2020

Hi Gang,

Not to much progress on the model building front. I just got back to the 3/4 inch Case steam tractor build this afternoon looking at some deviations from Rudy's original plans. I will let you know how it works out next report. Meanwhile I spent another week trying to organize my metal stock here in the shop and in the back room. In Photo 1 you can see all my hex stock, brass stock, round stock and flat stock in 1 foot lengths starting to show some semblance of organization.



Photo 1

Photo 2 is in the back room with my aluminum stock all neat on 2 shelves in ascending size from .062 to 1-1/2 thick long job that one and a lot further to go in that room.



Photo 2

Now all hasn't been work this past two weeks. In the spaces that had a conglomeration of different sizes, materials and shapes of metal and an old television and cassette deck I have put on display some of the models that I had built in the past and seemed to remain in crates between model engineering shows. I figured what the heck I might as well enjoy looking at them myself Photo 3.

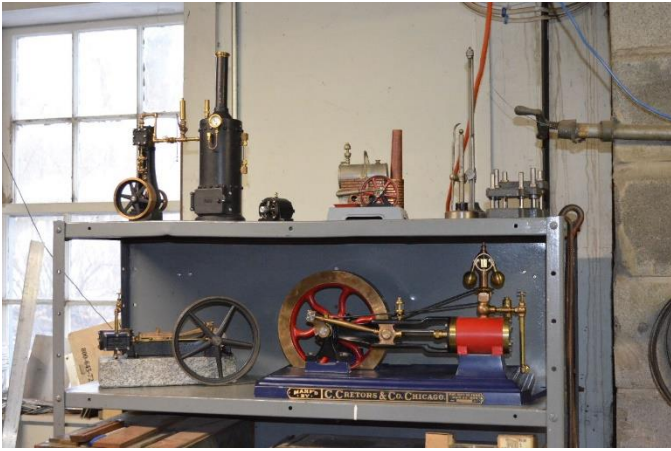


Photo 3

Well that is it for this week more model building next week, in the meantime stay safe, stay healthy, stay sane and get to the shop and either straighten it out or build something.

Dick B.

Richard L. Boucher
 Chief Engineer/Master Mechanic/ Lead Machinist
 Sandy Hill Locomotive Works

December 13, 2020

i All,

Well the two week hiatus from machining while I worked on arranging my metal stock was a good thing for me though the metal arranging is far from over. This week I got a lot of the small bits surrounding the cylinder made. I put the crosshead guides back in the lathe, indicated the round boss true and drilled and tapped them 0-80 and drilled the sockets in the rear cylinder heads through with an 0-80 clearance drill and counter sunk the cylinder side. This modification made the cylinder mounting to the boiler shell much more rigid. I then proceeded to make all the pistons piston rods valve spindles valves and gland nuts for both the cylinders and valve chests. Remember I am building three of these tractors. All the external threads were single point turned to insure concentricity with the shafts. Photo 1 is a piston rod being threaded 4-40.



Photo 1

Photo 2 is the cylinder head gland nut being threaded 1/4-28 the steam chest gland nuts were threaded 10-32.

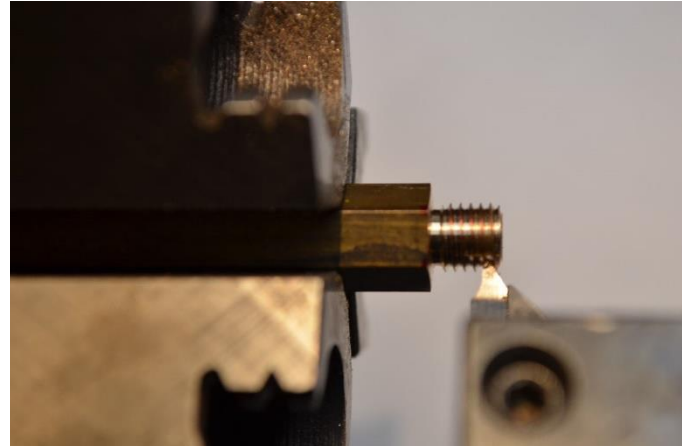


Photo 2

Notice I had modified my Arthur R. Warner threading tool to finish the thread close to the shoulder of the nut but that is OK as there are two more cutting tips on that insert. Photo 3 is boring the hole in the cylinder head gland nut.

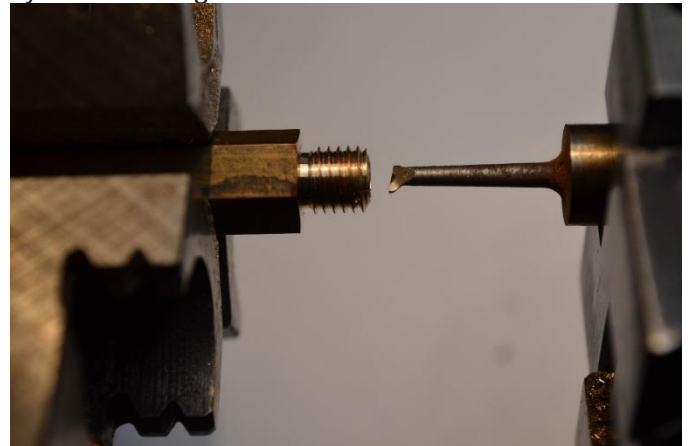


Photo 3

By cutting a single point thread and taking a chip with a boring bar before reaming these holes concentricity is assured. The hole in the steam chest gland got the same treatment. The cylinder gland nut hole is 1/8 and the steam chest nut hole is 3/32. Photo 4 is parting off the finished gland nut again using my Werner high speed insert thin bit tool.

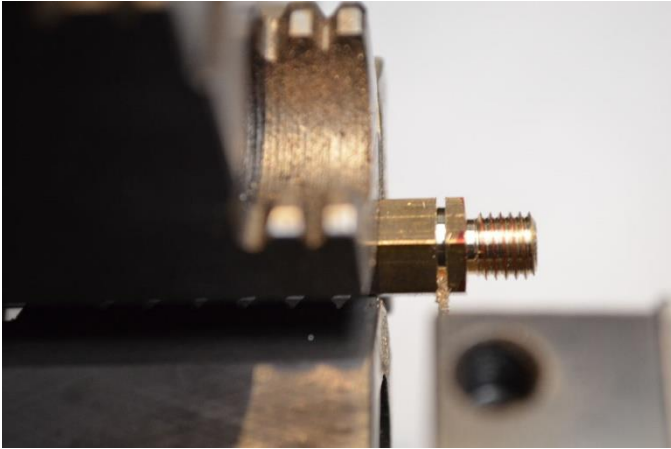


Photo 4

All the tooling I used for this work was the high speed insert system from Werner. (disclaimer here, I get no compensation for mentioning this tooling I just like it very much) Photo 5 shows just how small these parts are.



Photo 5

Photo 7 is milling the exhaust passage in the valves.

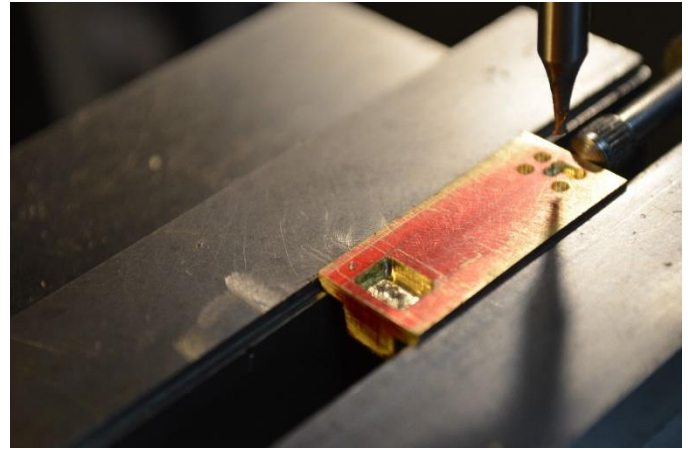


Photo 7

Note, when working parts this small it is a good idea to do as much machining when the piece is on a stick as possible, these valves are 1/2 by 9/32 by 15/64 thick. they were completely machined on the stick then cut apart and the last face finished to bring the 9/32 dimension to size. The cavities in this view are 1/4 by 3/16 done with a 1/16 end mill. Photo 8 is the weeks work.

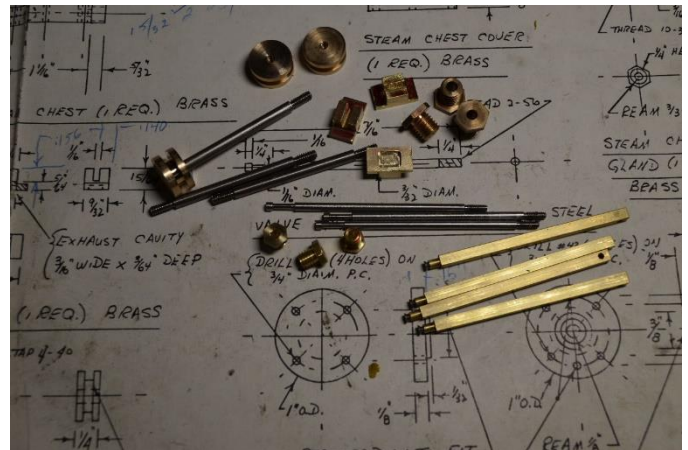


Photo 8

The 3/32 valve spindles were machined from 1/8 stainless steel stock using the bring out from the collet 1/4 inch at a time and machining the 1/32 off in one pass and bring the stock out another 1/4 and continuing on, I call it the wash rinse repeat system it works quite well and just a touch with some wet of dry paper polished the pieces quite well. Photo 6 I think I have shown this system before using a dial indicator to get a very positive repeatability when making multiple features from a single starting point, in this case the exhaust port was cut on one side of the part and the slot for the valve stem was cut on the opposite side from the same datum point.

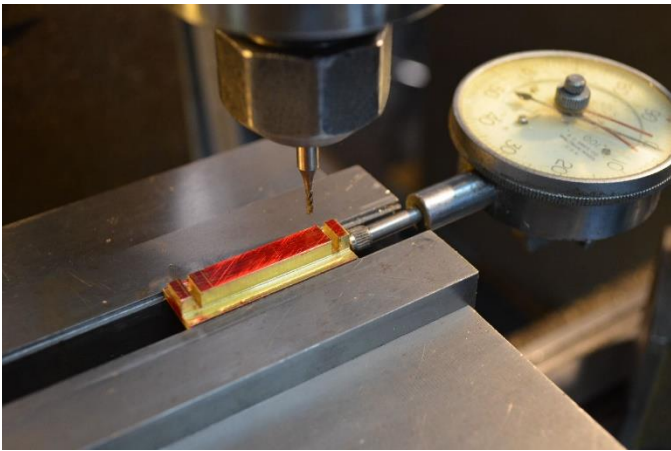


Photo 6

Look at the valves in photo 8 and that is all the details on drawing 10.

Well that is all for this week and as always stay safe, stay healthy and stay sane. So now go down to the shop and build something.

Dick B.

Richard L. Boucher
 Chief Engineer/Master Mechanic/ Lead Machinist
 Sandy Hill Locomotive Works

Dec 20, 2020

Hey all,

Well, it has been a very productive week here at the Sandy Hill Locomotive Works. The week started out working on the crank web, Photo 1.



Photo 1

The shape of the inner part was done with my spindex fixture in the Bridgeport. It was just a bit of manipulating the cutter back and forth and a bit of rotating the spindex. I guess I fouled up by not taking a picture of this setup. Photo 2 shows the two pieces assembled.



Photo 2

Photo 3 is the weeks worth of work with the crankarms and smoke stack pieces.

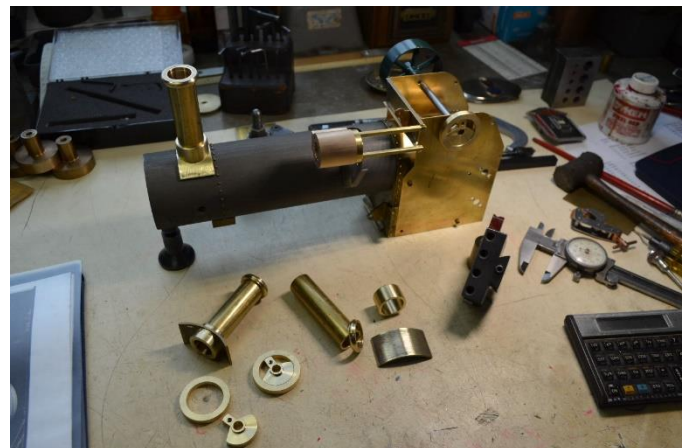


Photo 3

Note the form cutter in the quick change block next to the dial caliper. It was used to create the detail on the stack cap. It was made quickly by using a 1/8 stone in my flex shaft tool. The base of the stack was formed by annealing the piece of brass and clamping one end to the boiler shell and tapping it to fit the boiler shell. It took two annealings to get it to a snug fit. Next came the tricky part of putting the hole in the stack base. The first operation was to center it both ways in the vise on the Hardinge mill and center drill a hole completely through the part, next in Photo 4 I plunged a 3/4 two flute endmill through the part

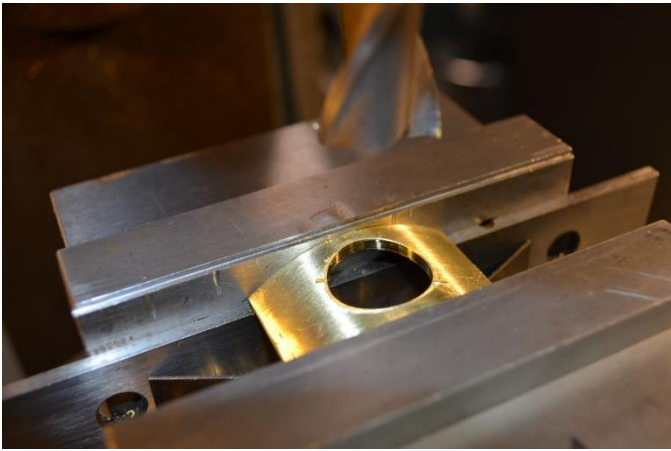


Photo 4

and then in Photo 5 I opened the part out to a slip fit with it's adjoining part.

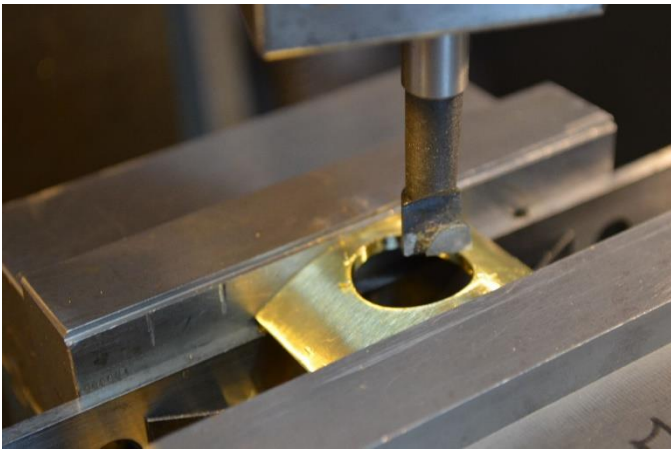


Photo 5

Photo 6 is the stack after silver soldering.



Photo 6

All three are now residing in a pickle bath to clean them up, I use white vinegar to pickle brass parts.

Next week I will have a picture of the pickled parts as they will be in the bath for a day or two.

Well that may not seem like a lot accomplished but remember we had a Nor'easter this past week which caused a bit of an interruption.

So now I say stay healthy stay safe and stay sane and go down in the shop and make something.

Dick B.

Richard L. Boucher
Chief Engineer/Master Mechanic/ Lead Machinist
Sandy Hill Locomotive Works

December 27, 2020

Hi Gang and those reading the NEMES Gazette, I say and those reading the NEMES Gazette because I think this will be my first submission for the February issue as I am sure Bob is putting the finishing touches on the January issue as I write.

[Editor's Note: Bob has managed to get this one in the January Gazette!]

This week in Photo 1 is a picture of the silver soldered tractor stack after a couple days in the white vinegar pickle compare this to the picture in last week's installment.



Photo 1

All the stack needed at that point was a quick rubdown with a piece of Scotch Brite to finish cleaning them up. Photo 2 is machining the rounded side of the base of the stack.

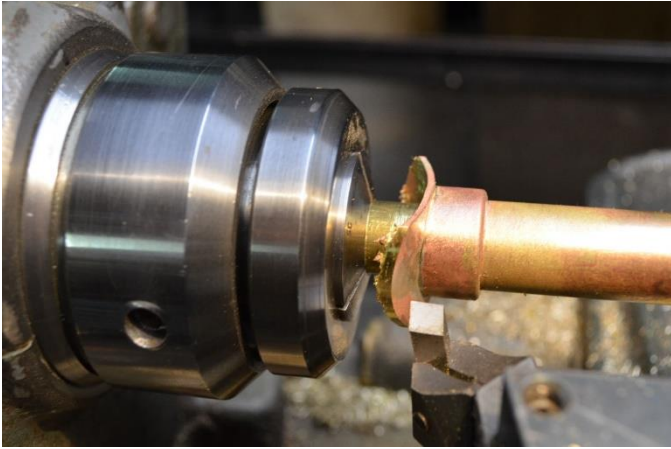


Photo 2

It is funny and a caution all of you look at the print. I was wondering just how I was going to hold the part to cut the curve with a saw and file and had even made a template to mark the part with when I took another look at the drawing and realized that the edge was just a part of a circle that could be generated in the lathe as in the photo. I made a tapered brass plug and jammed it into the stack, held the brass plug in a collet and supported the other end with a live center and Robert is your mother's brother. Part looks great.

Photo 3 illustrates holding the part in my milling machine vise and drilling the mounting holes at the proper angle in the stack brace.

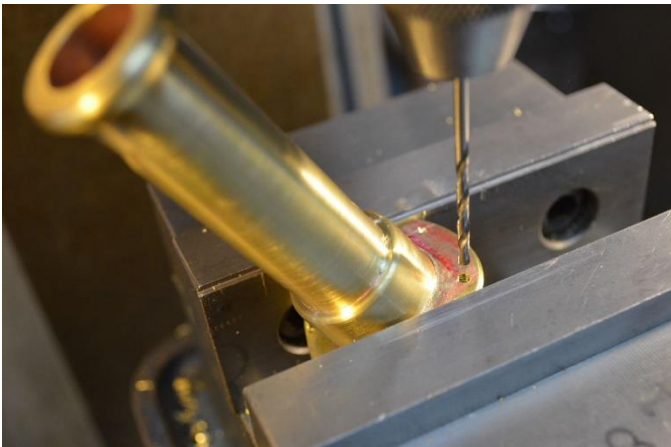


Photo 3

The photo also shows how the Scotch Brite put a nice finish on the piece.

Moving on to Photo 4 drilling and tapping the holes in the boiler barrel locating the holes from the holes in the stack base.



Photo 4

I did mark each stack and boiler with a number and side that it fit on the boiler as I kind of used my calculated eyeball to locate the starting points the holes in the stack bases. The brass tube that I held the stacks in the lathe can be seen in the stack aligning the stack with the 1/2 inch hole in the smoke box.

Now lets move on to some of my work holding devices. Photo 5 is a tool that I machined from a casting almost 60 years ago when I was an apprentice.

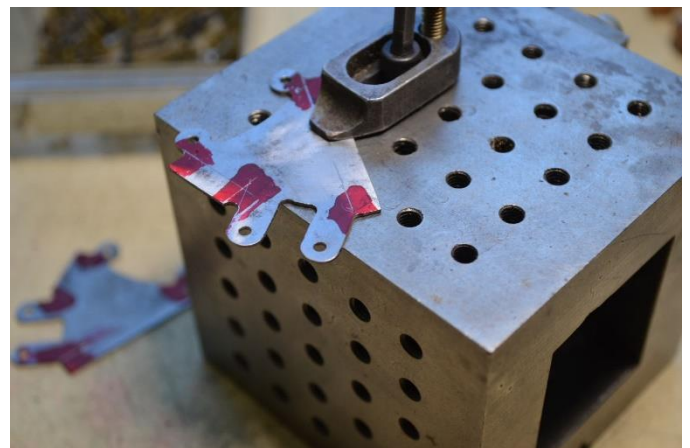


Photo 5

Our instructors gave us the cube and angle plate castings to machine and hand tap all those 10-32 holes, We also made the little straps and had them

heat treated as part of our curriculum. I did the machining in a large crank arm shaper. They came out very nice and square and required very little grinding to finish them off. If you ever find such tooling in a shop or flea market grab it!! The part I am holding in the picture is one of the cylinder mounting brackets. I am just holding it so I can mark out the bending lines and the corner that has to be notched out. So much easier to work with when it is mounted on something like the cube. Photo 6 is just another work holding device that is really simple to make, any nice clean piece of steel can be used.

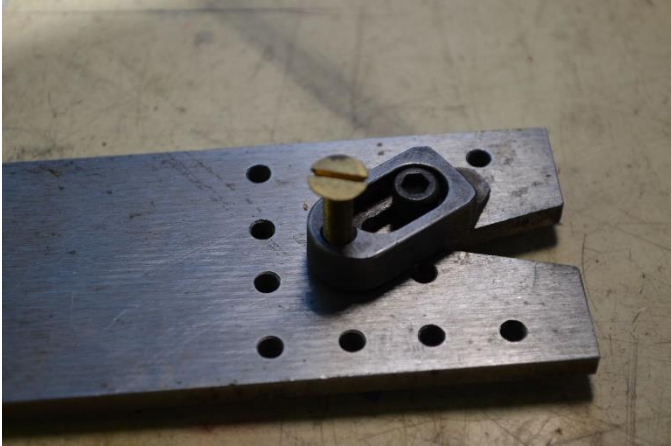


Photo 6

A few of the 10-32 tapped holes and a hack saw notch and it is finished. Photo 7 shows the holding fixture in my large Prentice bench vise with the cylinder bracket mounted on it getting ready to cut the scribed lines of the notch with a jewelers saw.

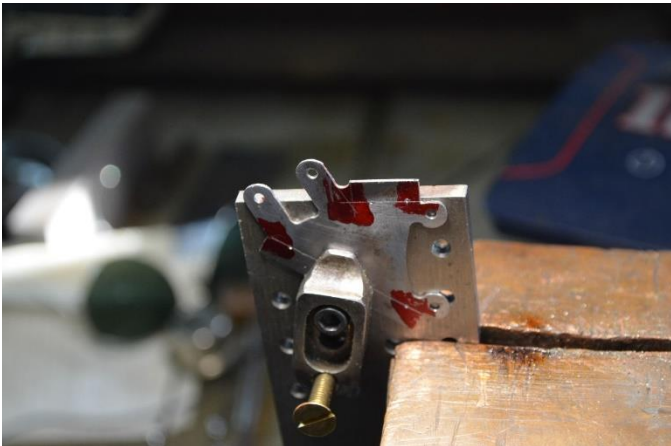


Photo 7

Photo 8 shows the holding device I used to hold the pieces together while I silver soldered them.



Photo 8

I used the plate that I fixtured the parts on in the CNC mill and used screws and nuts to support the plate away from the aluminum so it didn't act as a heat sink and the clamp device to hold the second piece. Worked out great.

Photo 9 is a repair part for my machinist vise which I broke with my tremendous strength.



Photo 9

I am showing this part just as an example of making as much of the part as you can leaving it as part of the material it is being made from, In this case the part is complete when I saw it from the parent stock and belt sand the saw marks off the part. Oh yea, another single point lathe job. Photo 10 is the vise with the new part ready to be assembled and be good as new.

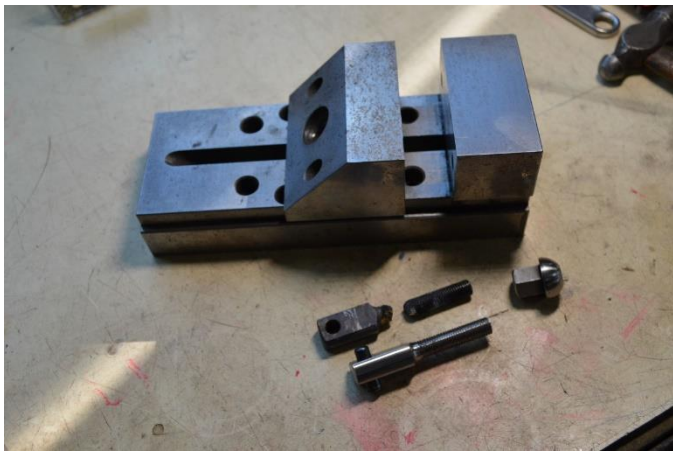


Photo 10

So here we have a week's worth of work in the shop in Photo 11 the stacks all finished and mounted on the boilers and the cylinder brackets just short of the mounting holes in the flange for mounting on the boiler shell, the only thing missing is the vise repair.



Photo 11

Well that is it for this installment, so keep safe, keep healthy and go down to the shop and create something even if it is just a hand full of chips from a piece of scrap stock. That might motivate you to work on a project.

Dick B.

Richard L. Boucher
Chief Engineer/Master Mechanic/ Lead Machinist
Sandy Hill Locomotive Works

P.S. I should add custodian to the list of hats I wear in the signature as this place is in constant need of a broom push.

Shop Hints and Kinks

Bob Timmerman

This month's column is about screw thread systems, that people may not have run into. I am taking my data from the Twentieth Edition of Machinery's Handbook copyright 1975, or 45 years ago. This is before the screw thread systems changed to metric, so there is a lot of information about the older standards in this book.

Everybody is familiar with the normal U.S. Standard systems, National Coarse, and National Fine. There is also a National Extra Fine Series, finer than the fine thread series. The only time I have run into it is in the threads connecting a microphone with its stand, for a one particular microphone designed by Bell Labs in the late 1930s. This mike used a 5/8-24 thread, which is a standard Extra Fine Thread.

In addition to the standard threads where the threads per inch decrease as the size increases, there are special series of threads for industrial purposes, which have a constant number of threads per inch. The standards cover 4,6,8,12,16,20,28, and 32 threads per inch.

When reasonably high quality microphones were first being designed in the 1930s, there was no standardization on the threads on microphone stands. RCA used 1/2 pipe threads. I have an old RCA mike and desk stand (some people might have seen this on Zoom calls) The threads are very well made, and it is pleasure to put them together.

Microphone stands have come to be made out of brass tubing. It turns out that there is a standard thread for tubing, a constant 27 threads per inch, for tubing diameters from 1/4" to 1". It is also used on lamp tubing. You have to cut these threads with taps and dies, as many lathes do not have 27 threads per inch. My 9" South Bend has 26 and 28 threads per inch on the quick change gearbox, but no 27. However, it does have 18 threads per inch, so I probably could use a 3:2 transposing gearset to get 27 threads per inch. I have two older lathes that use loose change gears to cut threads, and neither have 27 threads per inch on the threading chart.

Surprisingly, 5/8-27 seems to have caught on as an international standard for microphone stands. I have 3 mikes made in the US, one has 1/2" pipe thread for

the stand, and two have 5/8-27 threads for the stand. I have 3 mikes made in Austria, and all of them came from the factory with 5/8-27 threads. One came with a special European plug, but 5/8-27 U.S. standard threads for the stand.

Bolt thread standards have changed over the years. While 12 threads per inch is a recognized constant pitch thread, the standard starts with 9/16". However, many years ago, 1/2" bolts were threaded with 12 threads per inch, not 13, as is used today. Woe be to anyone who thinks they can clean up battered old 1/2" threads by running a modern 1/2-13 die over it. When working on old machinery, you have to check the threads actually used before starting to work on it.

Pipe threads are a world unto themselves. While dimensions of pressure pipe and electrical conduit are the same, the threads have a different profile. Joints between conduit and electrical boxes are made up with locknuts. The threads are to pipe thread dimensions, but they are straight, and cut to the highest possible diameter to leave as much metal between the conduit inside diameter and the root of the thread.

Threaded joints intended to carry pressure are made up with a taper of 3/4 inch per foot. The joints wedge together forming a pressure-tight joint.

British and American piping standards differ. The dimensions of the pipe appear similar, and both use a 3/4" per foot taper, but the British use the Whitworth thread, while the U.S. uses the 60 degree thread. The big difference is that the *number of threads per inch for the same pipe size is different in the two countries!*

The following short table will make this clear:

Pipe Size	Threads per inch	
	British	U.S
3/8	19	18
1/2	14	14
3/4	14	14
1	11	11 1/2
1 1/4	11	11 1/2
1 1/2	11	11 1/2

You get lucky with 1/2" and 3/4" pipe, but the rest of the sizes have a slight difference, just enough to cause a lot of frustration if you try to put them together.